

PROPELLER SHAFT / DRIVE SHAFT / AXLE

PDA

1. General Description
2. Propeller Shaft
3. Front Axle
4. Front Hub Unit Bearing
5. Rear Drive Shaft
6. Rear Axle
7. Rear Hub Unit Bearing
8. Symptoms and causes

PROPELLER SHAFT / DRIVE SHAFT / AXLE > General Description

CAUTION

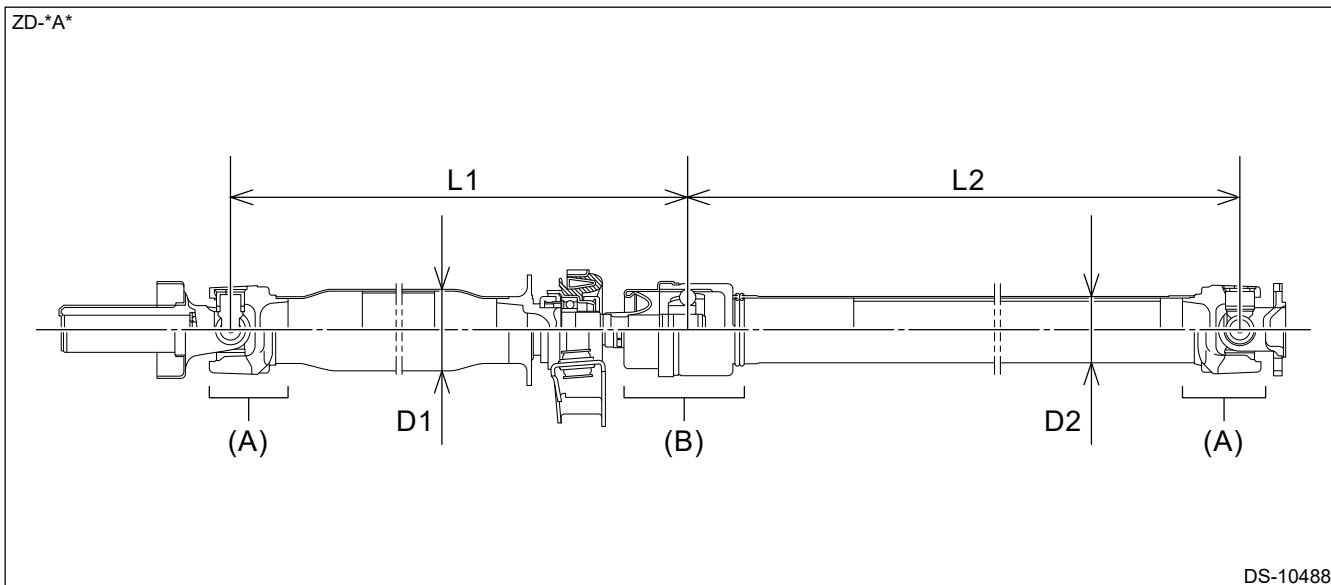
- When performing service operation, refer to "Repair Contents" in "General Description".  [Ref. to REPAIR CONTENTS>Repair Contents.](#)
- Prior to starting work, pay special attention to the following:
 1. Always wear work clothes, a work cap, and protective shoes. Additionally, wear a helmet, protective goggles, etc. if necessary.
 2. Protect the vehicle using a seat cover, fender cover, etc.
 3. Prepare the service tools, clean cloth, containers to catch grease and oil, etc.
- Prevent scattering of grease and oil. If it scatters, wipe it off immediately to prevent it from penetrating the floor or flowing out, to protect the environmental.
- If the grease and oil is spilt over the engine, exhaust pipe or the under cover, completely wipe it off to avoid emission of smoke or causing a fire.
- Vehicle components are extremely hot immediately after driving. Be wary of receiving burns from heated parts.
- When performing a repair, identify the cause of trouble and avoid unnecessary work.
- Before disconnecting connectors of sensors or units, be sure to disconnect the ground terminal from the battery sensor.
- Always use the jack-up point when the lifting device, shop jacks or rigid racks are used to support the vehicle.
- Before starting works, remove dirt and corrosion around the target area.
- Keep the removed parts in order and protect them from dust and dirt.
- All removed parts, if to be reused, should be reinstalled in the original positions with attention to the correct directions, etc.
- For the parts except for the non-reusable parts, replace them with new parts if necessary.
- Be sure to tighten bolts and nuts to the specified torque.
- Always use new application oil during work.
- Be sure that the brake disc and brake pad is free from grease or oil.

PROPELLER SHAFT / DRIVE SHAFT / AXLE > General Description

SPECIFICATION

1. PROPELLER SHAFT

Joint type		Cardan joint + Double offset constant velocity joint	
Propeller shaft (front side) joint-to-joint length: L1	mm (in)		511.5 (20.14)
Propeller shaft (rear side) joint-to-joint length: L2	mm (in)		795.5 (31.32)
Outer diameter of tube:	mm (in)	D1	70.0 (2.76)
		D2	57.0 (2.24)

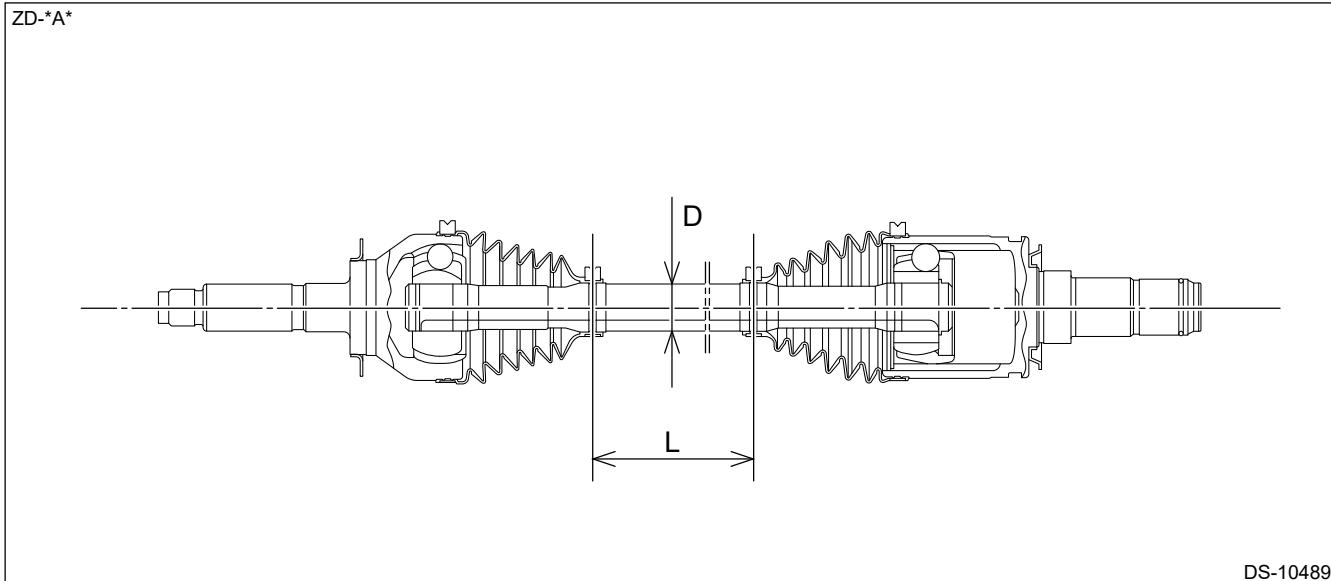


(A) Cardan joint

(B) Double offset constant velocity joint

2. REAR DRIVE SHAFT

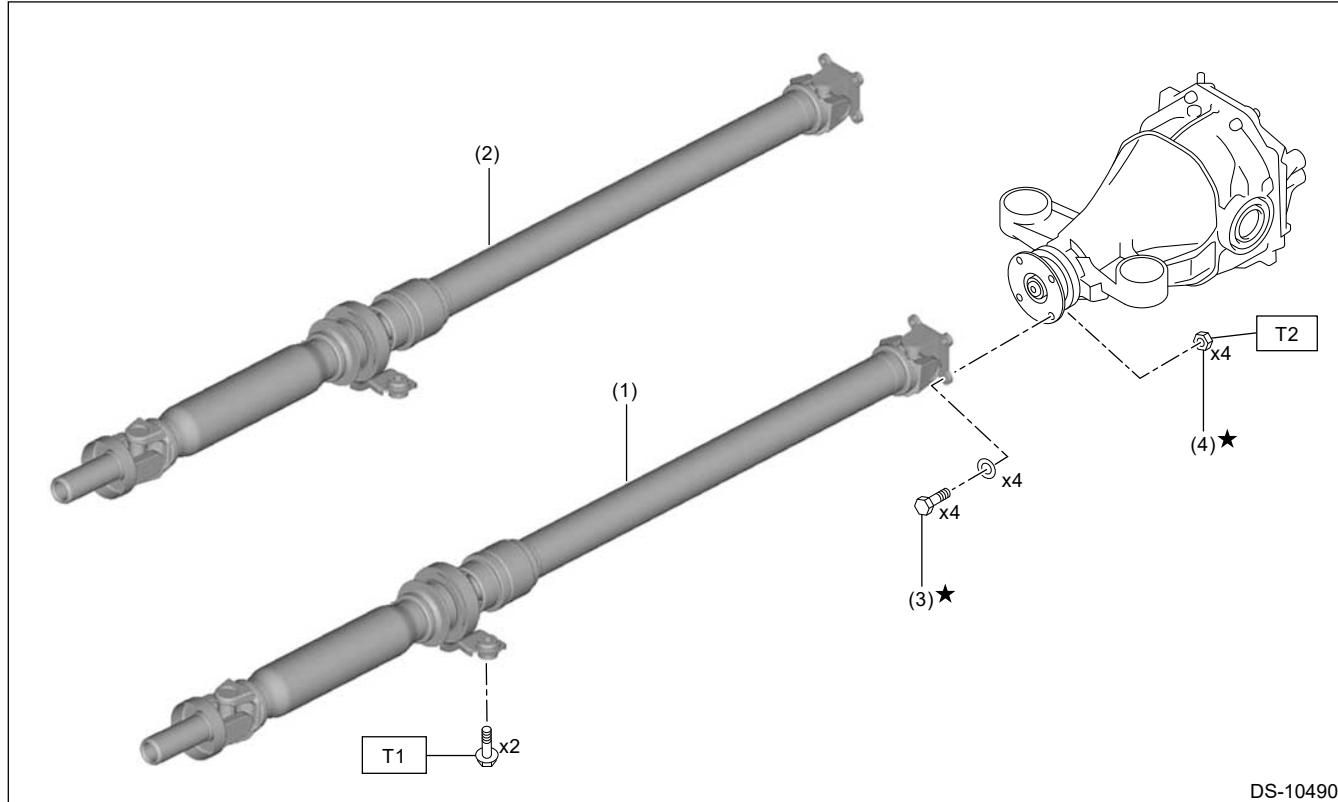
Joint type	IN side	Double offset constant velocity joint
	OUT side	Rzeppa constant velocity joint
Axle length: L	mm (in)	300.0 (11.81)
Axle diameter: D	mm (in)	28.1 (1.11)



PROPELLER SHAFT / DRIVE SHAFT / AXLE > General Description

COMPONENT

1. PROPELLER SHAFT



(1) Propeller shaft (AT model)

(3) Bolt

Tightening torque: N·m (kgf·m, ft-lb)

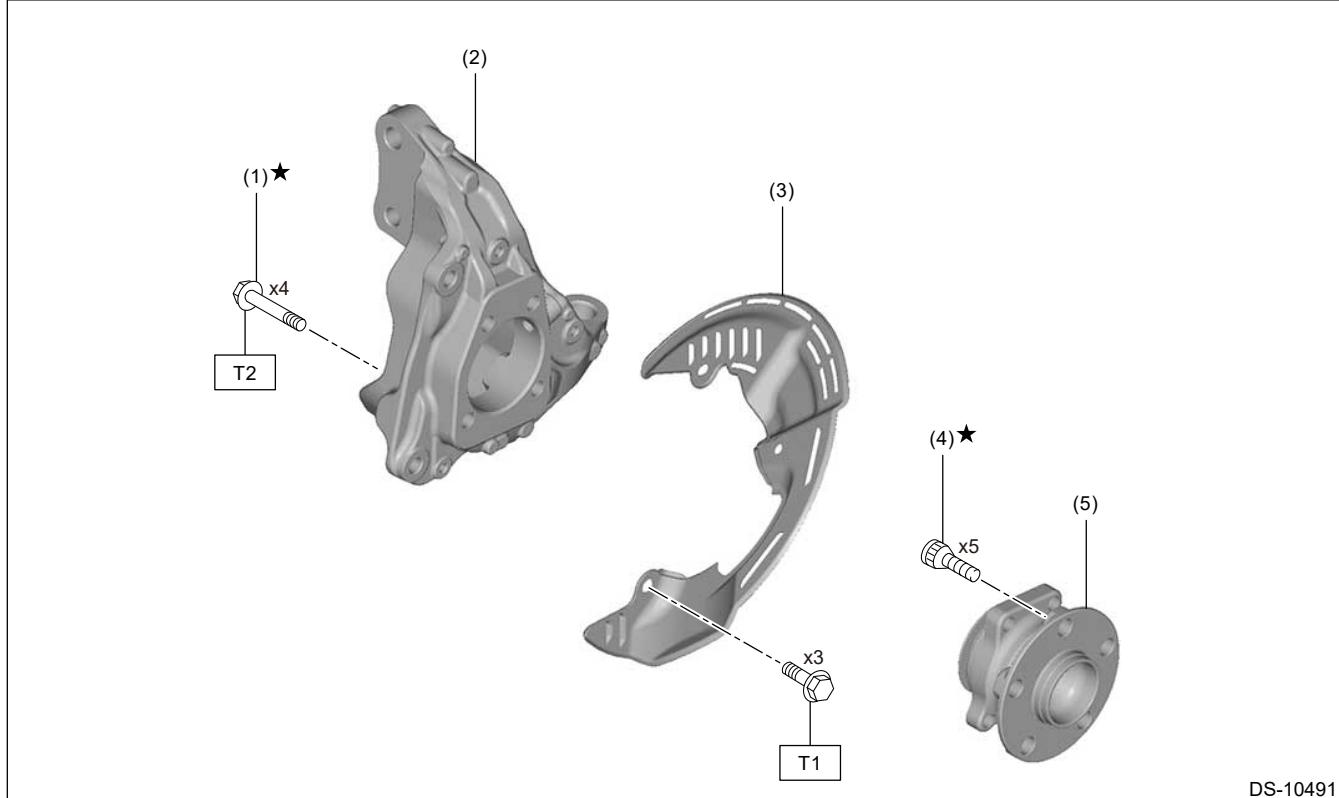
(2) Propeller shaft (MT model)

(4) Nut

T1: 52 (5.3, 38.4)

T2: 74 (7.5, 54.6)

2. FRONT AXLE



(1) Bolt

(4) Hub bolt

Tightening torque: N·m (kgf·m, ft-lb)

(2) Front axle housing

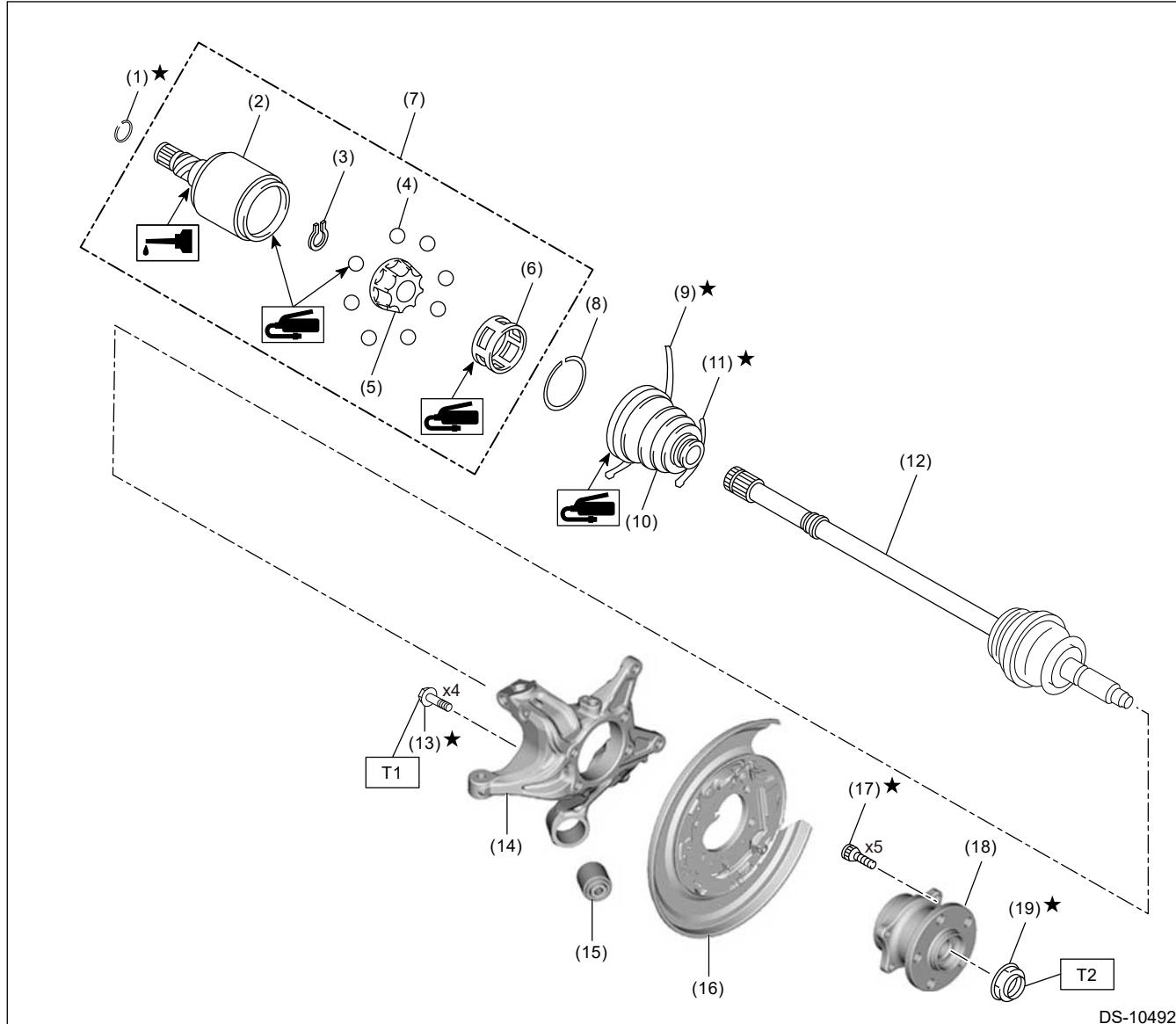
(5) Front hub unit bearing

T1: 18 (1.8, 13.3)

(3) Front brake back plate

T2: 95 (9.7, 70.1)

3. REAR AXLE AND REAR DRIVE SHAFT



- | | | |
|----------------|-----------------------------------|--|
| (1) Circlip | (9) Boot band (large) | (17) Hub bolt |
| (2) Outer race | (10) Boot (IN side) | (18) Rear hub unit bearing |
| (3) Snap ring | (11) Boot band (small) | (19) Axle nut |
| (4) Ball | (12) Shaft ASSY | |
| (5) Inner race | (13) Bolt | Tightening torque: N·m (kgf·m, ft-lb) |
| (6) Cage | (14) Rear axle housing | T1: 85 (8.7, 62.7) |
| (7) Joint unit | (15) Rubber bushing trailing link | T2: 190 (19.4, 140.1) |
| (8) Circlip | (16) Rear brake back plate | |

PROPELLER SHAFT / DRIVE SHAFT / AXLE > General Description

PREPARATION TOOL

1. SUBARU SPECIAL TOOL

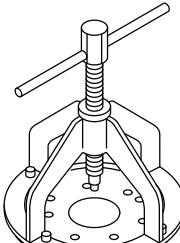
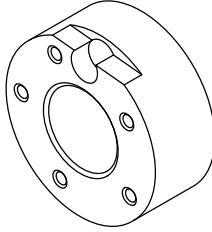
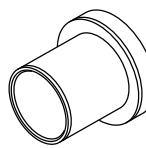
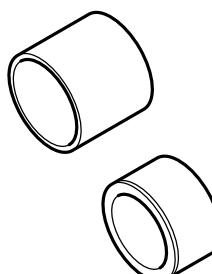
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-926470000	926470000	AXLE SHAFT PULLER	<p>Used for removing the drive shaft.</p> <p>Note: Used together with AXLE SHAFT PULLER PLATE (28099PA110).</p>
 ST-927080000	927080000	HUB STAND	Used for press-fitting hub bolt.
 ST20099FG000	20099FG000	BUSHING REMOVER	<p>Used for disassembling and assembling the rubber bushing trailing link bushing of the rear axle housing.</p> <p>Note: Used together with base part of INSTALLER & REMOVER (20099PA010).</p>
 ST20099PA010	20099PA010	INSTALLER & REMOVER	<p>Used for disassembling and assembling the rubber bushing trailing link of the rear axle housing.</p> <p>Note: Used together with BUSHING REMOVER (20099FG000).</p>

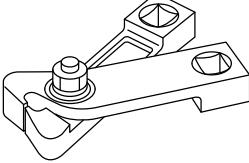
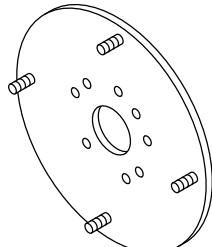
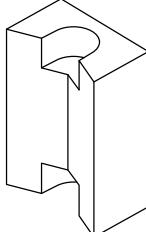
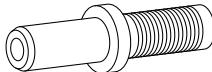
ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST28099AC000	28099AC000	BOOT BAND PLIER	Used for tightening the boot band of the rear drive shaft.
 ST28099PA110	28099PA110	AXLE SHAFT PULLER PLATE	Exchange with the plate of the AXLE SHAFT PULLER (926470000) to use.
 ST28399AG000	28399AG000	HUB STAND	Used for extracting hub bolt.
 ST0932520010	09325-20010	TRANSMISSION OIL PLUG	Used for removing the propeller shaft. (MT model)

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
	09325-40010 ST0932540010	TRANSMISSION OIL PLUG	Used for removing the propeller shaft. (AT model)
	— STSSM4	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. Note: <ul style="list-style-type: none">• For detailed operation procedures, refer to "Help" of application.• Used together with interface for Subaru Select Monitor (such as DST-i and DST-010).

2. OTHER

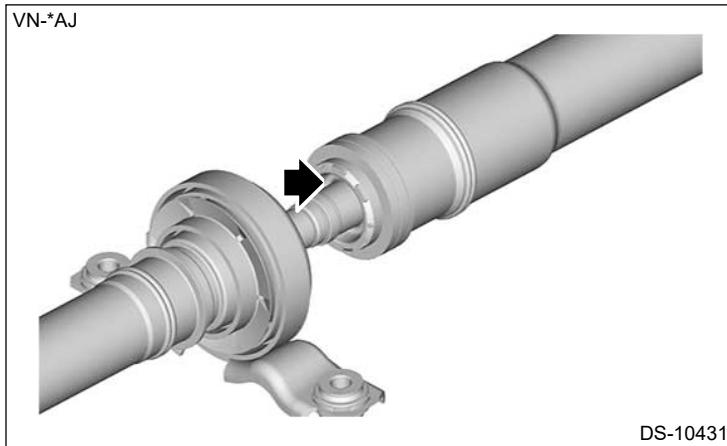
	REMARKS
Ball joint puller	Used for disconnecting joints.
Magnet stand	Used for measuring the propeller shaft and hub unit bearing. Note: Used together with dial gauge.
DIAL GAUGE	Used for measuring the propeller shaft and hub unit bearing. Note: Used together with magnet stand.
Crowbar	Used for removing the drive shaft.

PROPELLER SHAFT / DRIVE SHAFT / AXLE > Propeller Shaft

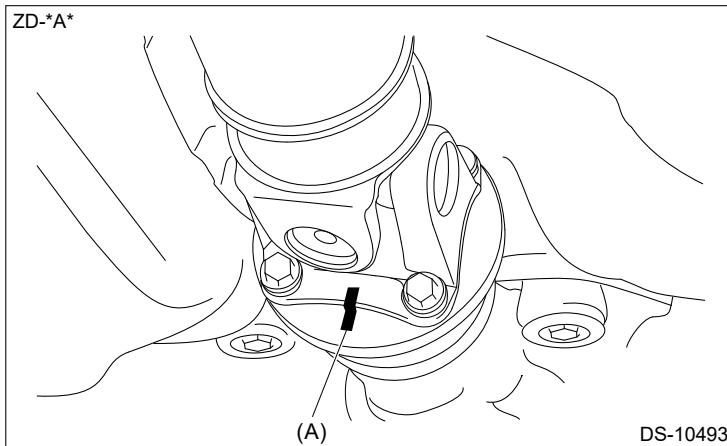
REMOVAL



1. Release the parking brake.
2. Release the shift lock and shift the select lever to the "N range". (AT model) [Ref. to CONTROL SYSTEMS>Select Lever>REMOVAL.](#)
3. Remove the rear exhaust pipe. [Ref. to EXHAUST\(H4DO\)>Rear Exhaust Pipe>REMOVAL.](#)
4. Wrap a cloth, etc. at the point shown in the figure to protect the boot.



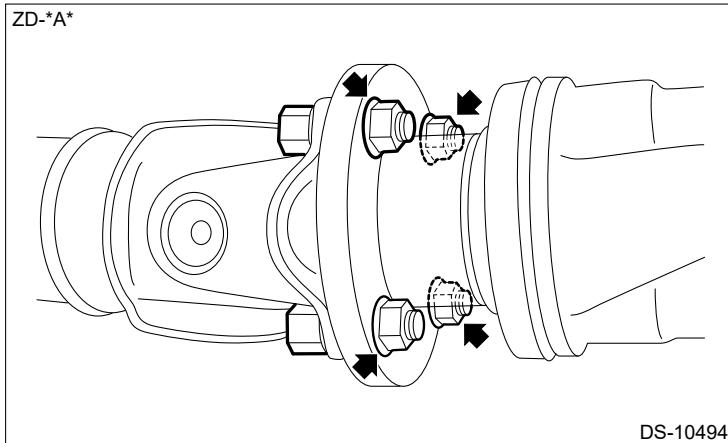
5. Place an alignment mark (A) on the joint portion of the propeller shaft and the rear differential.



6. Disconnect the propeller shaft and rear differential.

Caution:

- Turn and remove the nut while holding the bolt side.
- Do not bend the joint of the propeller shaft more than required.



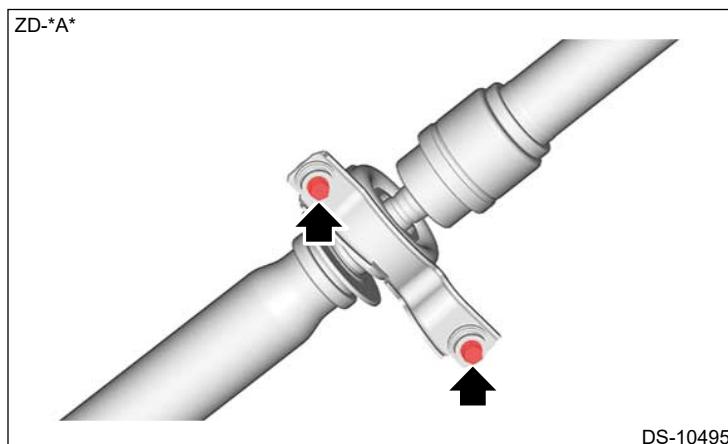
7. Remove the center bearing bolt and remove the propeller shaft.

Caution:

- Do not bend the joint of the propeller shaft more than required.
- Be careful not to damage the oil seal.
- After removal, protect the tip end with a cloth or the like.

Note:

Prepare the container for draining of engine oil.



8. Attach the ST to the transmission.

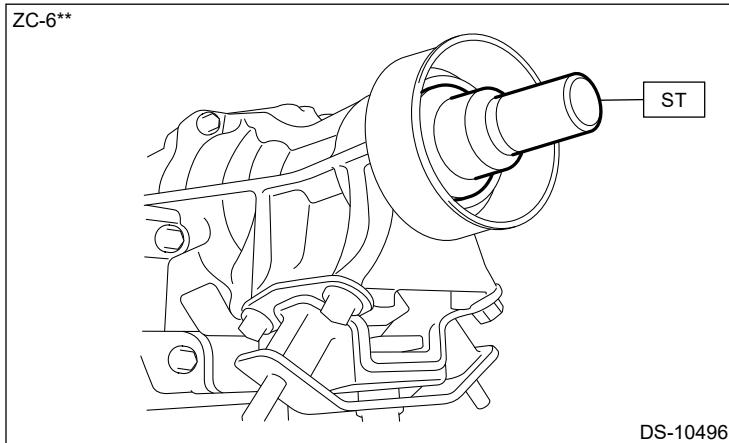
Caution:

- Be careful not to damage the oil seal.

Preparation tool:

ST: TRANSMISSION OIL PLUG (09325-40010) (AT model)

ST: TRANSMISSION OIL PLUG (09325-20010) (MT model)



PROPELLER SHAFT / DRIVE SHAFT / AXLE > Propeller Shaft INSTALLATION

1. Insert the sleeve yoke into the transmission and attach center bearing bolt.

Caution:

Do not bend the joint of the propeller shaft more than required.

Tightening torque:

52 N·m (5.3 kgf-m, 38.4 ft-lb)

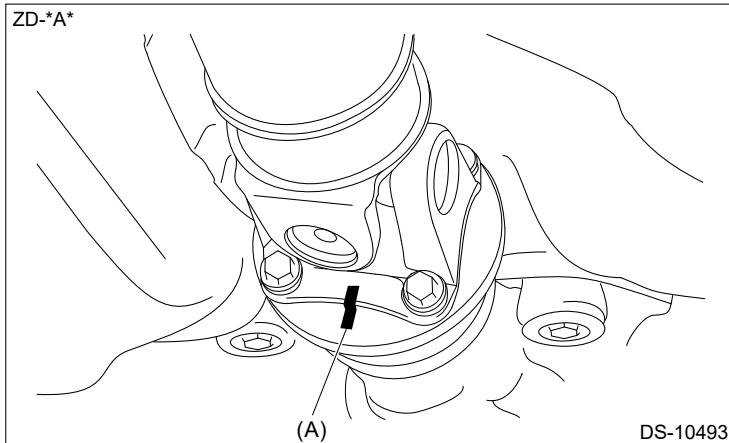
2. Align the alignment marks (A), and connect the propeller shaft and rear differential.

Caution:

Always use a new bolt and a nut.

Tightening torque:

74 N·m (7.5 kgf-m, 54.6 ft-lb)



3. Install the rear exhaust pipe. [Ref. to EXHAUST\(H4DO\)>Rear Exhaust Pipe>INSTALLATION.](#)
4. Release the shift lock and shift the select lever to the "P range". (AT model) [Ref. to CONTROL SYSTEMS>Select Lever>INSTALLATION.](#)
5. Apply the parking brake.
6. Check the ATF level. (AT model) [Ref. to AUTOMATIC TRANSMISSION>Automatic Transmission Fluid>INSPECTION.](#)
7. Check the level of the transmission gear oil. (MT model) [Ref. to MANUAL TRANSMISSION>Transmission Gear Oil>INSPECTION.](#)

PROPELLER SHAFT / DRIVE SHAFT / AXLE > Propeller Shaft

DISASSEMBLY

Propeller shaft cannot be disassembled.

PROPELLER SHAFT / DRIVE SHAFT / AXLE > Propeller Shaft

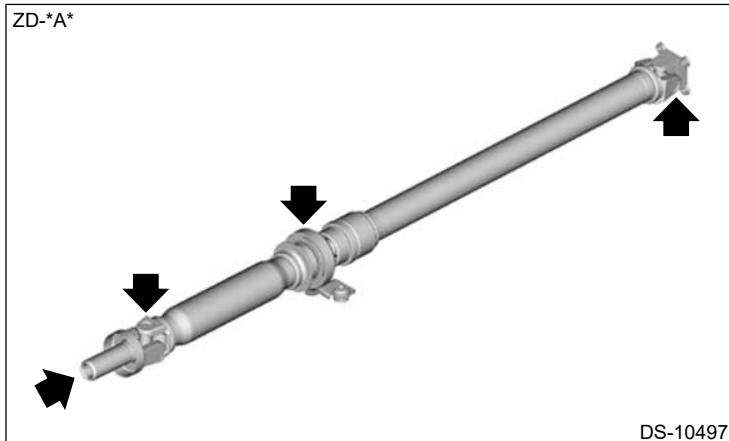
INSPECTION

1. Check that there is no deformation, cracks or other damages.
2. Check each part for looseness and runout.

Note:

Check with the propeller shaft installed to the vehicle.

- (1) Release the shift lock and shift the select lever to the "N range". (AT model)  [Ref. to CONTROL SYSTEMS>Select Lever>REMOVAL.](#)
- (2) Remove the rear exhaust pipe.  [Ref. to EXHAUST\(H4DO\)>Rear Exhaust Pipe>REMOVAL.](#)
- (3) Check for looseness while moving the splines, universal joint section and center bearing by hand.



- (4) Measure the runout of the propeller shaft using a magnet stand and dial gauge.

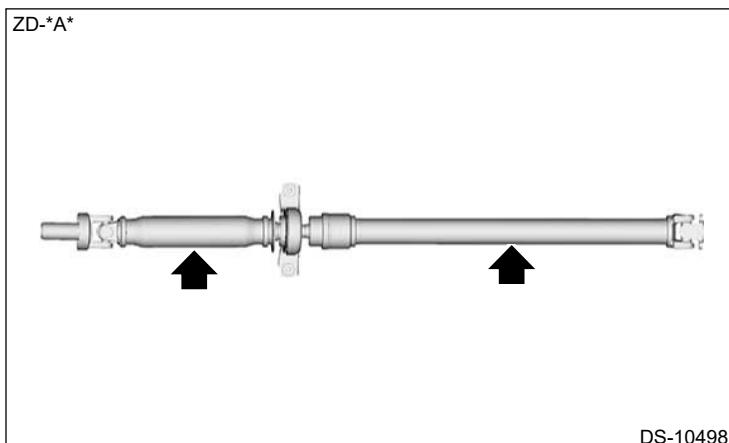
Note:

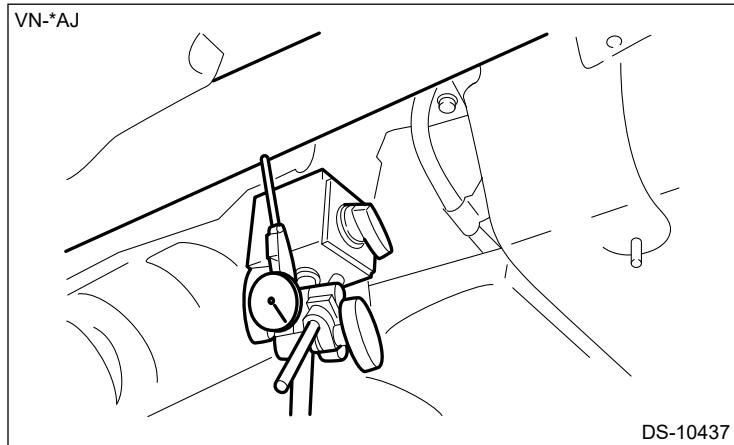
- **Measurement must be performed at the center of the propeller shaft.**
- **When measuring, turn the rear tier to rotate the propeller shaft.**

Service limit:

Front side: 0.8 mm (0.03 in)

Rear side: 0.8 mm (0.03 in)





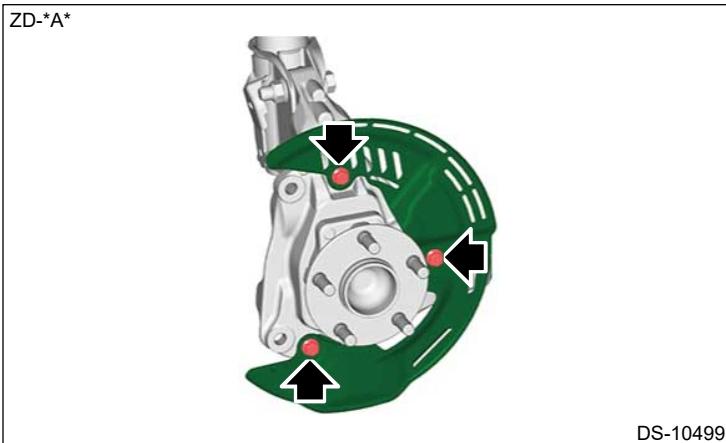
(5) Release the shift lock and shift the select lever to the "P range". (AT model)  [Ref. to CONTROL SYSTEMS>Select Lever>INSTALLATION.](#)

PROPELLER SHAFT / DRIVE SHAFT / AXLE > Front Axle

REMOVAL



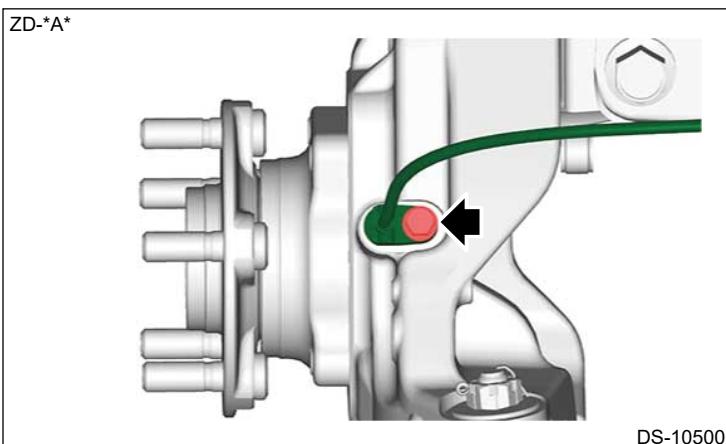
1. Remove the front wheels. [Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>REMOVAL.](#)
2. Remove the front disc rotor. [Ref. to BRAKE>Front Disc Rotor>REMOVAL.](#)
3. Remove the front brake back plate.



4. Remove the sensor sub assembly front.

Caution:

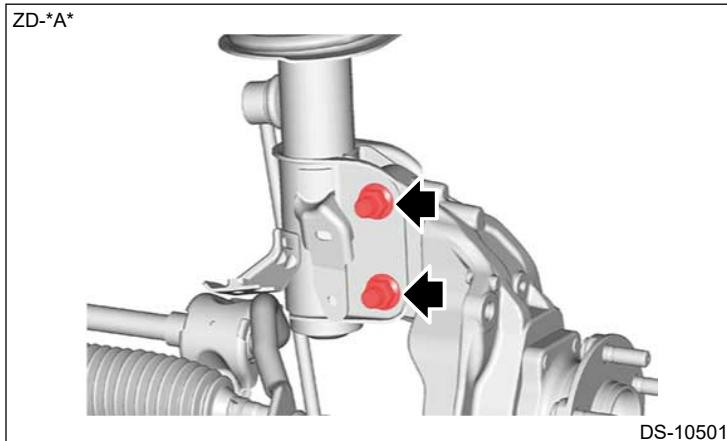
- Be careful not to damage the sensor.
- Do not apply excessive force to the sensor harness.



5. Loosen the flange nuts of the strut assembly.

Caution:

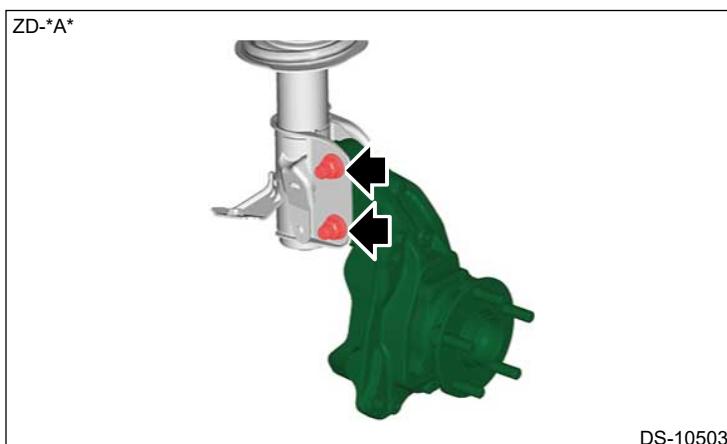
Loosen the nut side while holding the bolt side.



6. Disconnect the tie-rod end. [Ref. to POWER ASSISTED SYSTEM \(POWER STEERING\)>Tie-rod end>REMOVAL.](#)
7. Remove the arm assembly front. [Ref. to FRONT SUSPENSION>Front Arm>REMOVAL.](#)
8. Remove the front axle housing.

Caution:

Since the front axle housing is heavy, be careful not to drop it.



9. Remove the front hub unit bearing. [Ref. to PROPELLER SHAFT / DRIVE SHAFT / AXLE>Front Hub Unit Bearing>REMOVAL.](#)

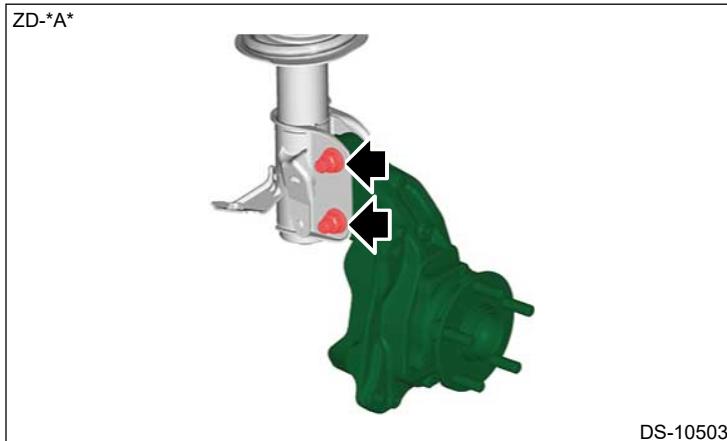
PROPELLER SHAFT / DRIVE SHAFT / AXLE > Front Axle

INSTALLATION

1. Install the front hub unit bearing. [Ref. to PROPELLER SHAFT / DRIVE SHAFT / AXLE>Front Hub Unit Bearing>INSTALLATION.](#)
2. Temporarily install the front axle housing to the strut assembly.

Caution:

Always use a new flange nut.



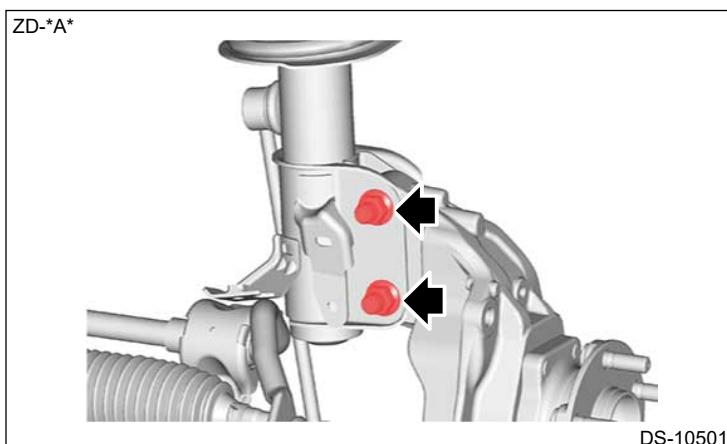
3. Install the arm assembly front. [Ref. to FRONT SUSPENSION>Front Arm>INSTALLATION.](#)
4. Tighten the flange bolts and flange nuts of the strut assembly.

Caution:

While holding the bolt side, tighten the nut to the specified torque.

Tightening torque:

155 N·m (15.8 kgf-m, 114.3 ft-lb)



5. Connect the tie-rod ends. [Ref. to POWER ASSISTED SYSTEM \(POWER STEERING\)>Tie-rod end>INSTALLATION.](#)

6. Install the sensor sub assembly front.

Tightening torque:

7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

7. Install the front brake back plate.

Tightening torque:

18 N·m (1.8 kgf-m, 13.3 ft-lb)

8. Install the front disc rotor. [Ref. to BRAKE>Front Disc Rotor>INSTALLATION.](#)

9. Install the front wheels. [Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>INSTALLATION.](#)

10. Inspect the wheel alignment and adjust if necessary. [Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION.](#)

11. Perform VSC (VDC) sensor midpoint setting mode. [Ref. to VEHICLE STABILITY CONTROL>VSC \(VDC\) Control Module and Hydraulic Control Unit \(VS/CCM&H/U\)>ADJUSTMENT > VSC \(VDC\) SENSOR MIDPOINT SETTING MODE.](#)

PROPELLER SHAFT / DRIVE SHAFT / AXLE > Front Axle

INSPECTION

- 1.** Check that there is no deformation, cracks or other damages.
- 2.** Check for excessive rusting.

PROPELLER SHAFT / DRIVE SHAFT / AXLE > Front Hub Unit Bearing

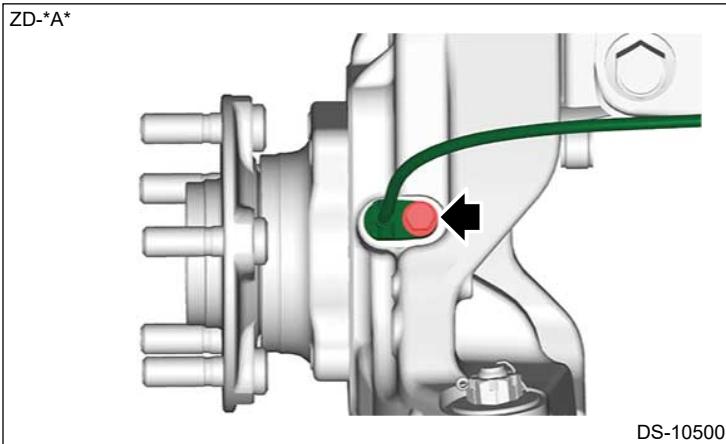
REMOVAL



1. Remove the front wheels. [Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>REMOVAL.](#)
2. Remove the front disc rotor. [Ref. to BRAKE>Front Disc Rotor>REMOVAL.](#)
3. Remove the sensor sub assembly front.

Caution:

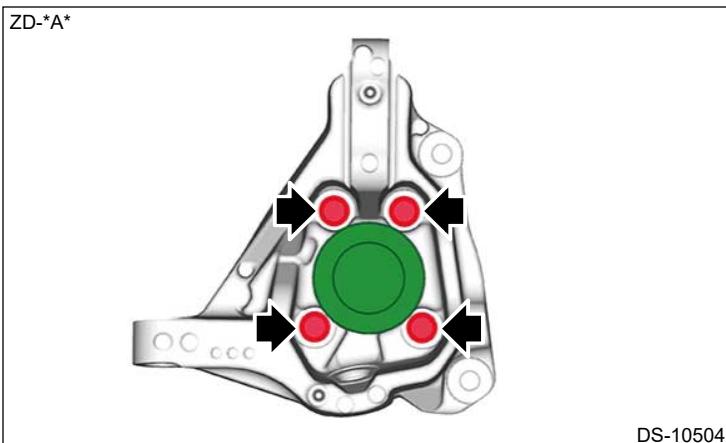
- Be careful not to damage the sensor.
- Do not apply excessive force to the sensor harness.



4. Remove the front hub unit bearing.

Caution:

- Be careful not to damage the front hub unit bearing.
- Do not get closer the tool which charged magnetism to the front hub unit bearing.



PROPELLER SHAFT / DRIVE SHAFT / AXLE > Front Hub Unit Bearing

INSTALLATION

1. Install the front hub unit bearing.

Caution:

- Always use a new bolt.
- Be careful not to damage the front hub unit bearing.
- Do not get closer the tool which charged magnetism to the front hub unit bearing.

Tightening torque:

95 N·m (9.7 kgf-m, 70.1 ft-lb)

2. Install the sensor sub assembly front.

Tightening torque:

7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

3. Install the front disc rotor. Ref. to BRAKE>Front Disc Rotor>INSTALLATION.
4. Install the front wheels. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>INSTALLATION.

PROPELLER SHAFT / DRIVE SHAFT / AXLE > Front Hub Unit Bearing**DISASSEMBLY**

**SUBARU
SST**

Using the ST and a press, pull out the hub bolt (B) from the front hub unit bearing (A).

Caution:

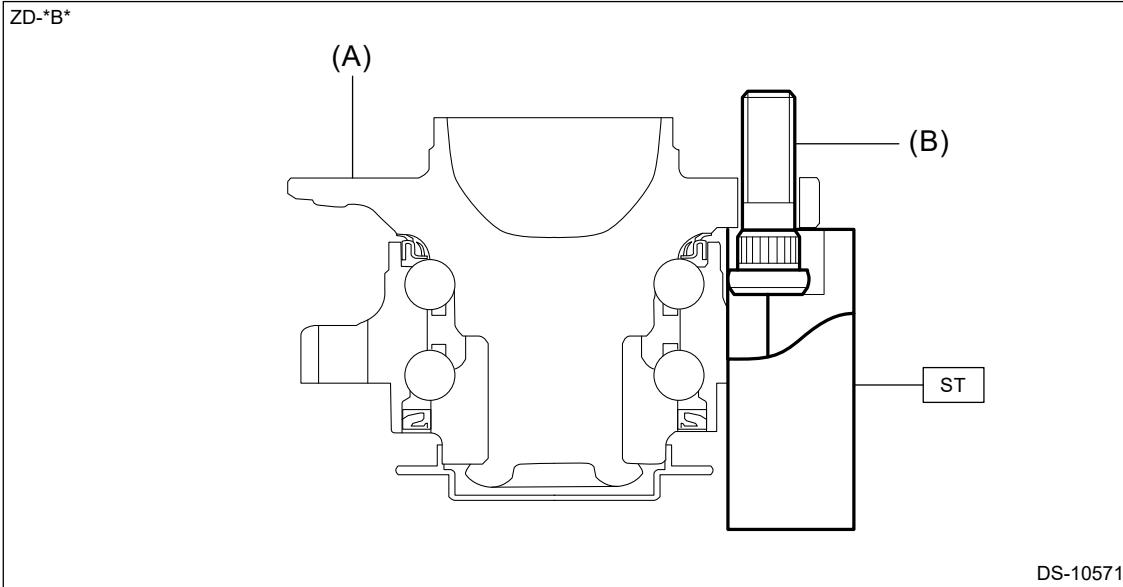
Be careful not to use a hammer, etc. to tap the hub bolts. This may deform the front hub unit bearing.

Note:

Front hub unit bearing cannot be disassembled.

Preparation tool:

ST: HUB STAND (28399AG000)

**PROPELLER SHAFT / DRIVE SHAFT / AXLE > Front Hub Unit Bearing****ASSEMBLY**

1. Set the front hub unit bearing and hub bolt to the ST.

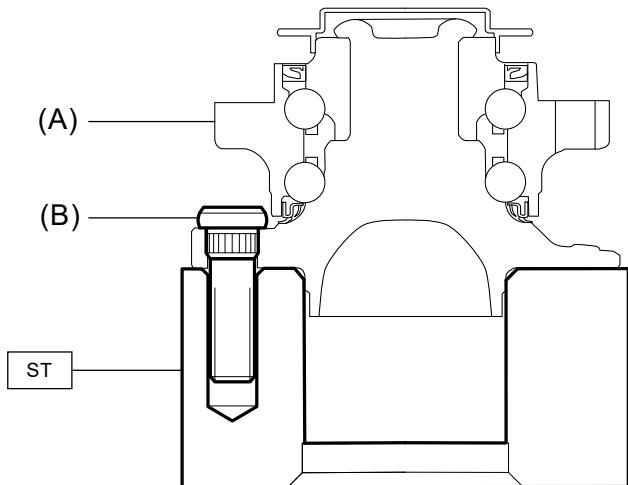
Caution:**Always use a new hub bolt.****Preparation tool:**

ST: HUB STAND (927080000)

- 2.** Using a press, press the hub bolt (B) until its seating surface contacts the hub unit bearing (A).

Note:**Use the 12 mm (0.5 in) dia. holes of ST to prevent bolts from tilting.**

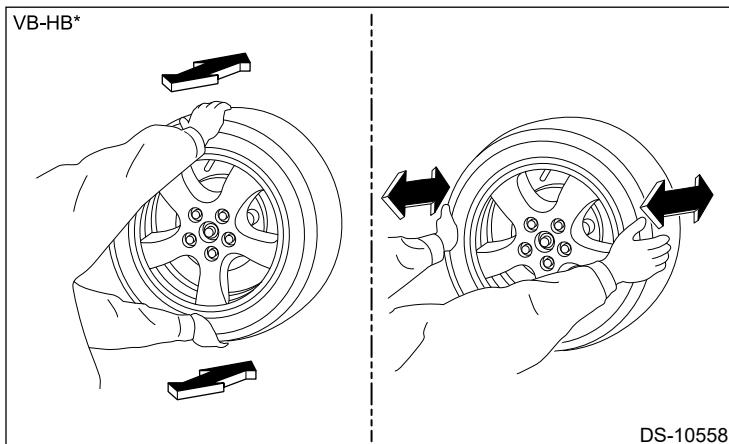
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PROPELLER SHAFT / DRIVE SHAFT / AXLE > Front Hub Unit Bearing**INSPECTION**

- 1.** Check that there is no deformation, cracks or other damages.
- 2.** Check for excessive rusting.
- 3.** Check the following items by turning the front tires by hand.
 - Check for smooth rotation.
 - Check for noise.
- 4.** Check the front hub unit bearing for looseness.
 - (1) Rock the front tire as shown in the figure.
 - Looseness exists → Go to next step.
 - No looseness → Normal (Perform step 5 if precise inspection is required.)



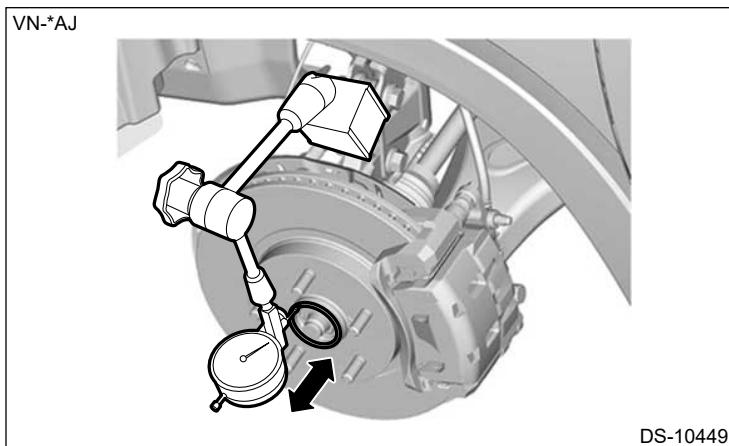
(2) Check the play with the brake pedal depressed using the same procedure as step (1).

- Looseness exists → Check the ball joint, each bushing, front suspension and front axle housing.
- No looseness → Replace the front hub unit bearing.

5. To perform a precise inspection, use a magnet stand and dial gauge to check for looseness in the axial direction of the front hub unit bearing.

Service limit:

0.05 mm (0.002 in)



PROPELLER SHAFT / DRIVE SHAFT / AXLE > Rear Drive Shaft

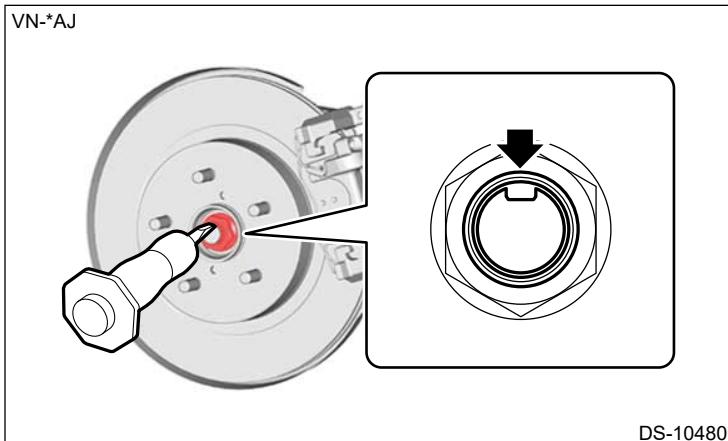
REMOVAL



Caution:

Do not loosen the axle nut while the rear axle is loaded.

1. Release the parking brake.
2. Release the shift lock and shift the select lever to the "N range". (AT model) [Ref. to CONTROL SYSTEMS>Select Lever>REMOVAL.](#)
3. Disconnect the ground terminal from battery sensor. [Ref. to REPAIR CONTENTS>NOTE > BATTERY.](#)
4. Remove the rear wheels. [Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>REMOVAL.](#)
5. Lift the crimped section of axle nut.



6. Remove the axle nut while depressing the brake pedal.
7. Drain differential gear oil. [Ref. to DIFFERENTIALS>Differential Gear Oil>REPLACEMENT.](#)
8. Remove the rear differential. [Ref. to DIFFERENTIALS>Rear Differential>REMOVAL.](#)

Caution:

If the circlip remains inside the rear differential, overhaul the differential case.

9. Pull out the rear drive shaft from the rear hub unit bearing.

Caution:

- Be careful not to damage the spline portion of the rear drive shaft.
- Be careful not to damage the rear hub unit bearing.

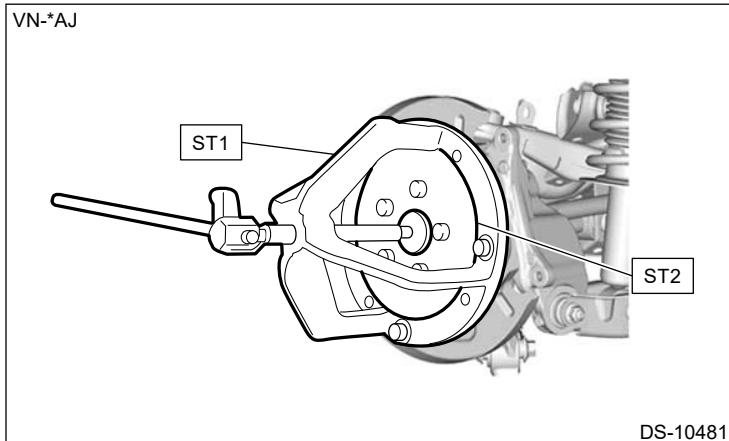
Note:

- If it is hard to remove, use ST1 and ST2.
- When using the ST1 and ST2, remove the caliper body. [Ref. to BRAKE>Rear Disc Brake Assembly>REMOVAL.](#)

Preparation tool:

ST1: AXLE SHAFT PULLER (926470000)

ST2: AXLE SHAFT PULLER PLATE (28099PA110)



PROPELLER SHAFT / DRIVE SHAFT / AXLE > Rear Drive Shaft INSTALLATION

Note:

When the rear drive shaft is removed using the ST, install the caliper body. [Ref. to BRAKE>Rear Disc Brake Assembly>INSTALLATION.](#)

1. Replace the rear differential side gear shaft oil seal with a new part. [Ref. to DIFFERENTIALS>Rear Differential Side Gear Shaft Oil Seal>REPLACEMENT.](#)
2. Replace the circlip with a new part.
3. Insert the drive shaft into the rear hub unit bearing.

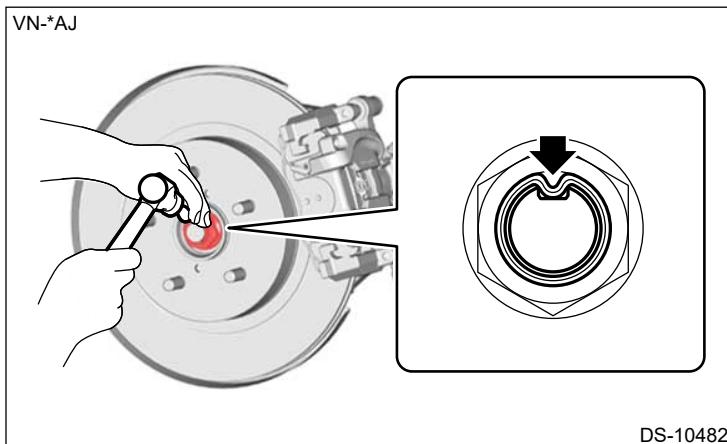
Caution:
 - Be careful not to damage the spline portion of the rear drive shaft.
 - Be careful not to damage the rear hub unit bearing.
 - Do not strike the rear drive shaft with a hammer, etc.
4. Temporarily attach the axle nut.

Caution:

Be sure to use a new axle nut.
5. Install the rear differential. [Ref. to DIFFERENTIALS>Rear Differential>INSTALLATION.](#)
6. Fill differential gear oil. [Ref. to DIFFERENTIALS>Differential Gear Oil>REPLACEMENT.](#)
7. While depressing the brake pedal, tighten the axle nut.

Tightening torque:

190 N·m (19.4 kgf-m, 140.1 ft-lb)
8. Crimp the axle nut.



- 9.** Install the rear wheels. [Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>INSTALLATION.](#)
- 10.** Release the shift lock and shift the select lever to the "P range". (AT model) [Ref. to CONTROL SYSTEMS>Select Lever>INSTALLATION.](#)
- 11.** Connect the ground terminal to battery sensor. [Ref. to REPAIR CONTENTS>NOTE > BATTERY.](#)
- 12.** After the operation is completed, apply and release the parking brake five times and ensure that the brake operates normally.
- 13.** Apply the parking brake.

PROPELLER SHAFT / DRIVE SHAFT / AXLE > Rear Drive Shaft

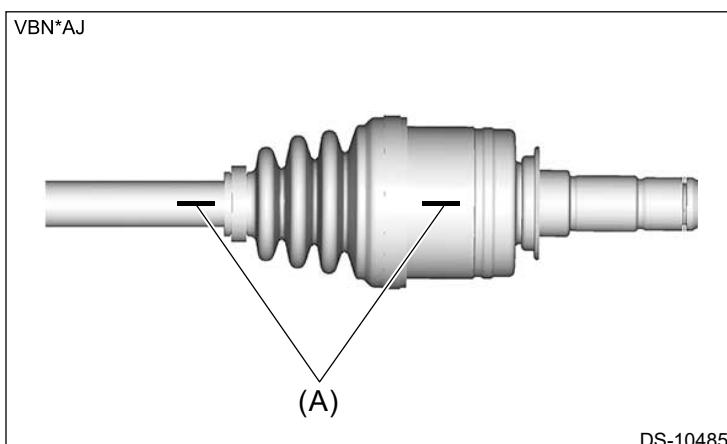
DISASSEMBLY



Note:

Shaft assembly (Rzeppa constant velocity joint and boot (OUT side)) cannot be disassembled.

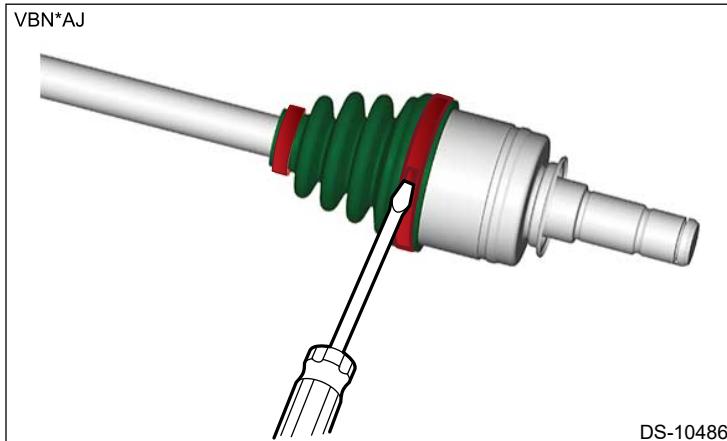
- 1.** Place alignment marks (A) on the shaft assembly and outer race.



- 2.** Remove the boot band (large) and boot band (small) and move the boot (IN side) to the central side of the shaft assembly.

Caution:

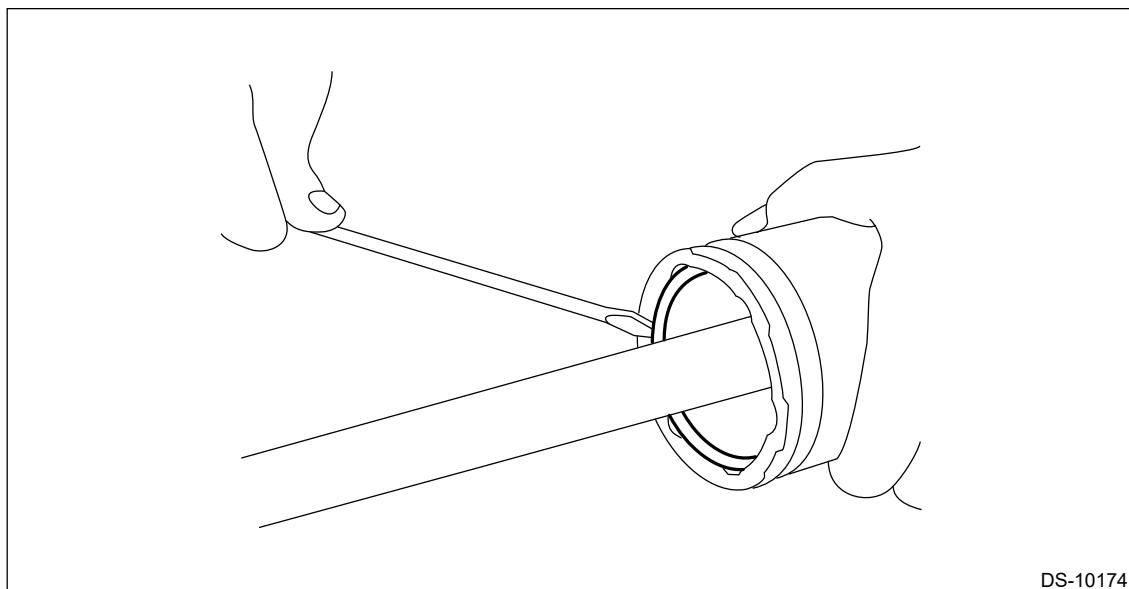
Be careful not to damage the boot (IN side).



3. Remove the circlip, and remove the outer race.

Caution:

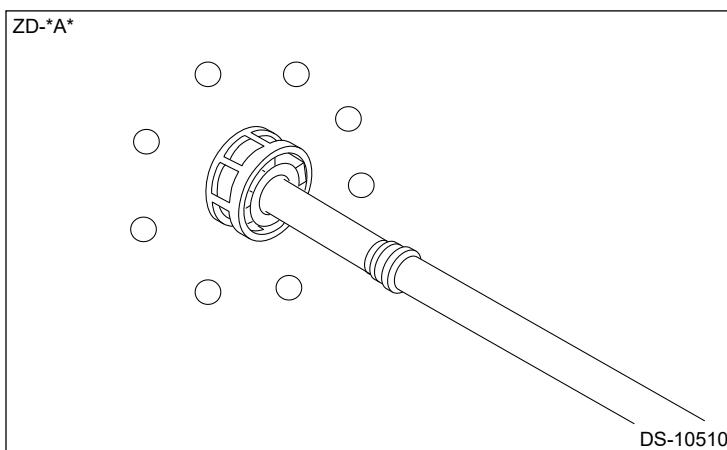
Be careful not to drop the ball.



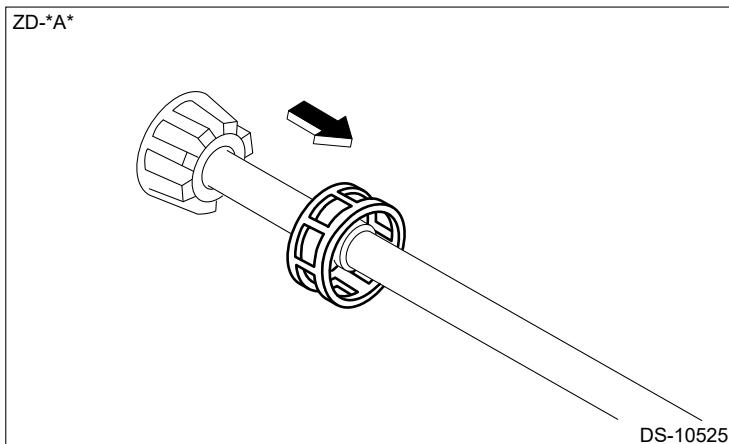
4. Remove the ball.

Caution:

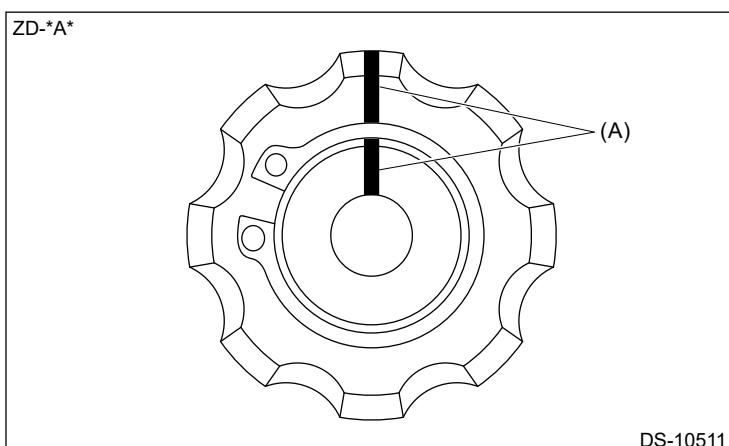
Be careful not to lose the ball.



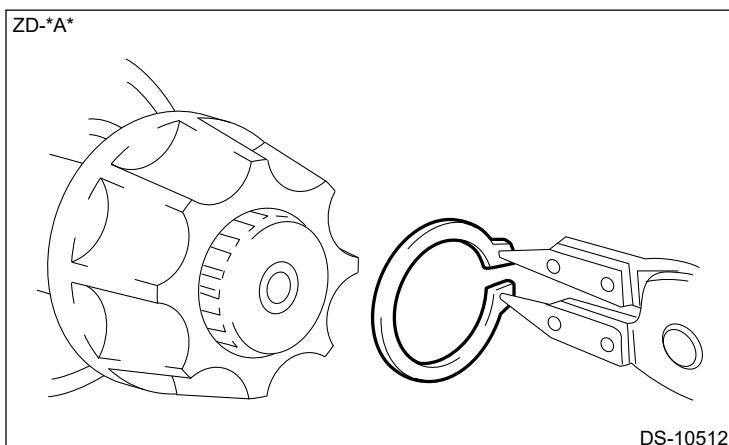
5. Rotate the cage by a half pitch to shift to the central side of the shaft assembly.



6. Wipe off the grease and place alignment marks (A) on the inner race and shaft assembly.



7. Remove the snap ring, and remove the inner race.



8. Remove the cage.
9. Remove the boot (IN side).

Caution:

Be sure to wrap the shaft assembly splines with vinyl tape, etc. to protect the boot (IN side) from scratches.

10. Clean each part.

Caution:

Be careful not to erase the alignment marks.

PROPELLER SHAFT / DRIVE SHAFT / AXLE > Rear Drive Shaft ASSEMBLY

- Pass the boot band (small), boot (IN side) and circlip through the shaft assembly.

Caution:

Be sure to wrap the shaft assembly splines with vinyl tape, etc. to protect the boot (IN side) from scratches.

- Pass the cage through the shaft assembly.

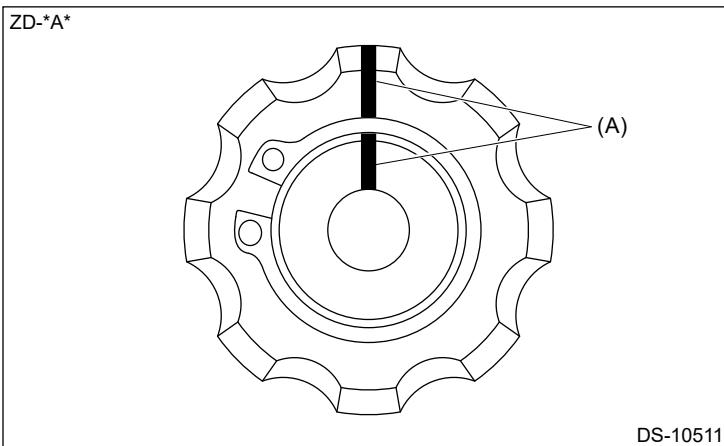
Note:

Insert the cage with its narrow part facing the boot (IN side).

- Set the inner race by aligning the alignment marks (A), and install the snap ring.

Caution:

Check that the snap ring is completely fitted.



- Install the cage to the inner race.

Note:

Insert by aligning the cage side face hole and the inner race protrusion and secure it by turning the cage by a half pitch.

- Apply 90 – 100 g (3.2 – 3.5 oz) of grease into the interior of outer race.

Preparation items:

Grease: NKG814 or the equivalent

- Apply a thin coat of grease to the ball and ball installation portion of the cage.

Preparation items:

Grease: NKG814 or the equivalent

- Set the balls to the cage.

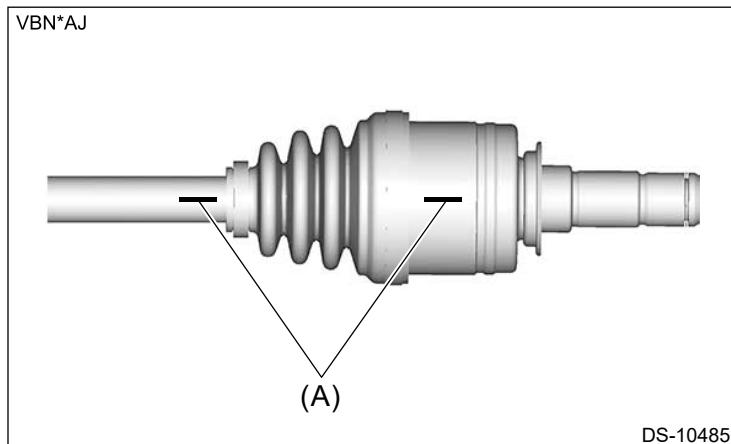
Caution:

Be careful not to drop the ball.

- Align alignment marks (A), set the outer race and install the circlip.

Caution:

Pull the shaft assembly lightly and assure that the circlip is completely fitted.



- 9.** Apply 45 — 50 g (1.6 — 1.8 oz) of grease evenly to the entire inner surface of boot (IN side).

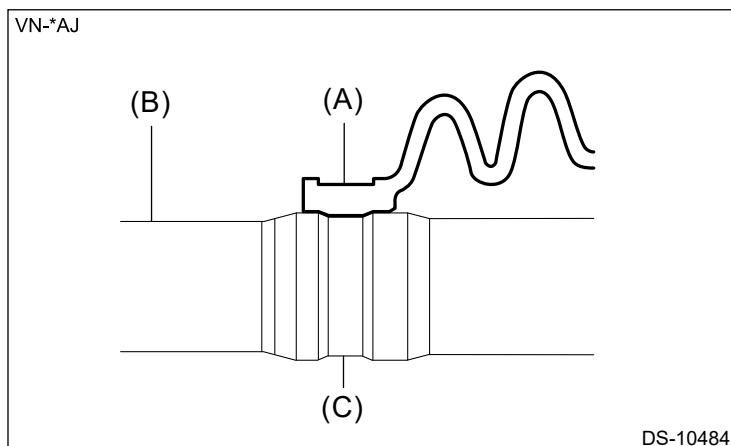
Preparation items:

Grease: NKG814 or the equivalent

- 10.** Install the boot (IN side).

Caution:

- Do not twist the boot (IN side).
- Completely remove any grease that comes out and adheres to the outer surface of the boot (IN side).
- Check that it fits in the boot groove securely.



(A) Boot (IN side)

(B) Shaft ASSY

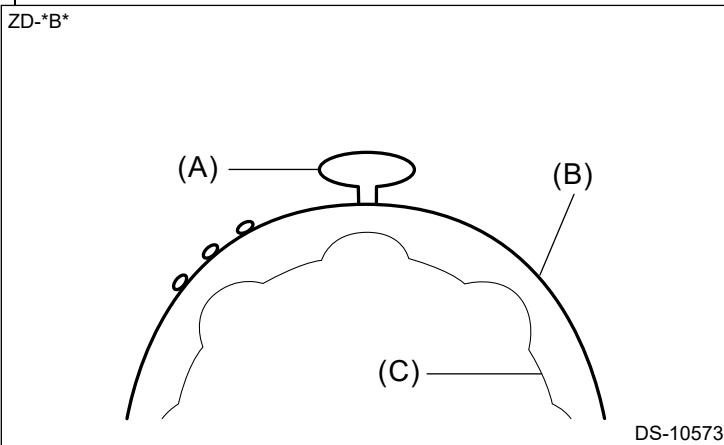
(C) Boot groove

- 11.** Set the new boot band (large) and new boot band (small).

- 12.** Tighten the boot band (large) and boot band (small) using the ST.

Caution:

The boot band (large) and boot band (small) are to be tightened so that the omega shaped part is at the position indicated in the figure.



(A) Omega shaped part

(B) Boot band

(C) Outer race

Tightening torque:**Boot band (large)**

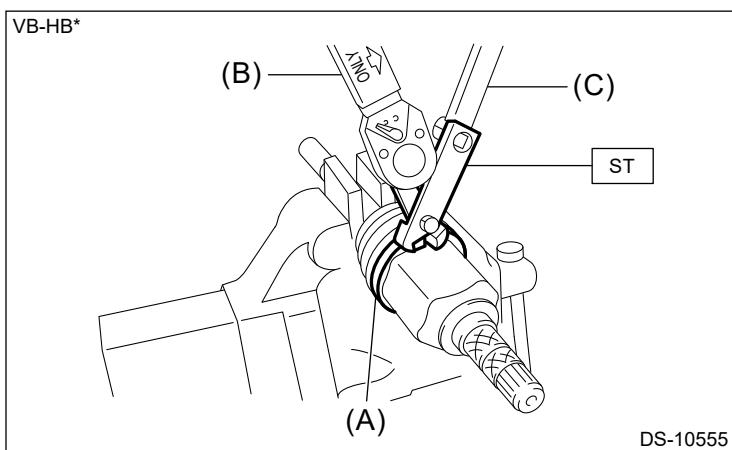
178 N·m (18.2 kgf-m, 131.3 ft-lb)

Boot band (small)

145 N·m (14.8 kgf-m, 106.9 ft-lb)

Preparation tool:

ST: BOOT BAND PLIER (28099AC000)



(A) Boot band

(B) Torque wrench

(C) Spinner handle, etc.

13. Extend and retract the boot (IN side) repeatedly so that grease is spread evenly.

PROPELLER SHAFT / DRIVE SHAFT / AXLE > Rear Drive Shaft**INSPECTION**

1. Check that there is no deformation, cracks or other damages.
2. Check for grease leakage.
3. Check the joint for looseness.
4. Check for excessive wear.

- 5.** Check for excessive rusting.

PROPELLER SHAFT / DRIVE SHAFT / AXLE > Rear Axle

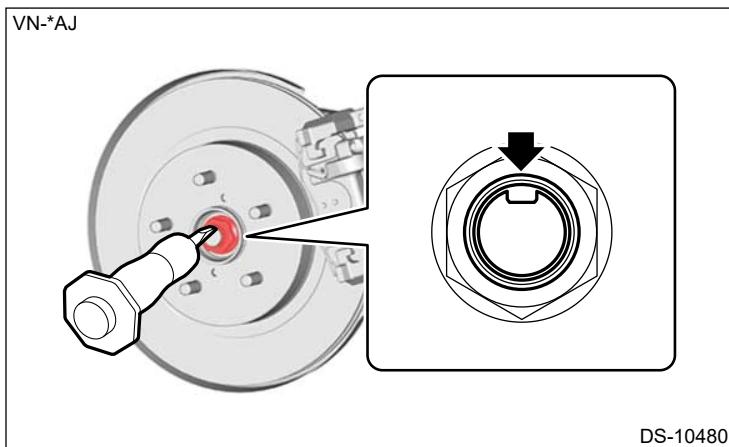
REMOVAL



Caution:

Do not loosen the axle nut while the rear axle is loaded.

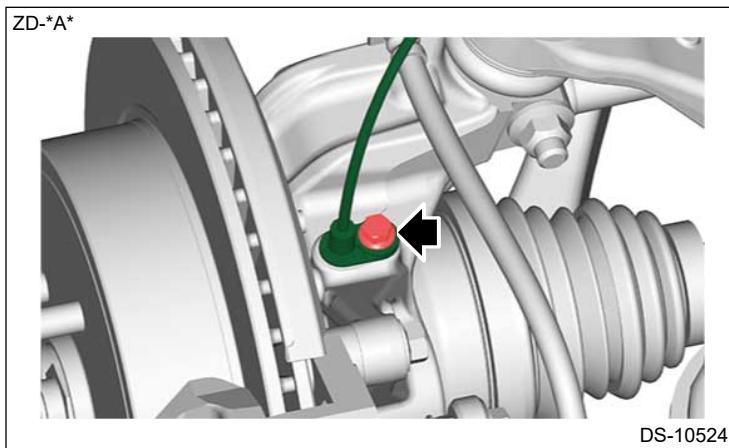
1. Release the parking brake.
2. Remove the rear wheels. [Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>REMOVAL.](#)
3. Lift the crimped section of axle nut.



4. Remove the axle nut while depressing the brake pedal.
5. Remove the sensor sub assembly rear.

Caution:

- Be careful not to damage the sensor.
- Do not apply excessive force to the sensor harness.



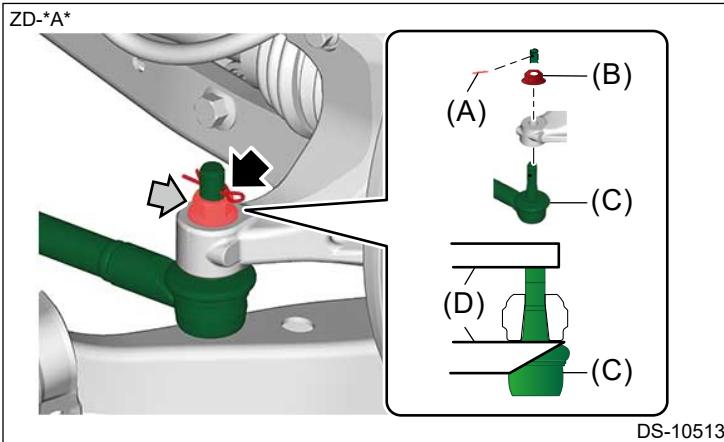
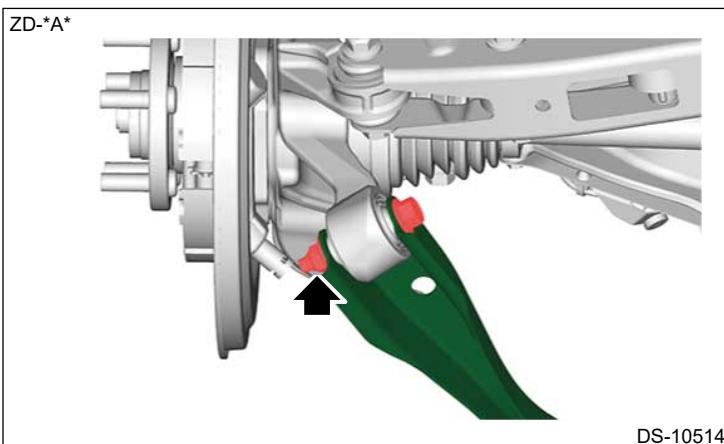
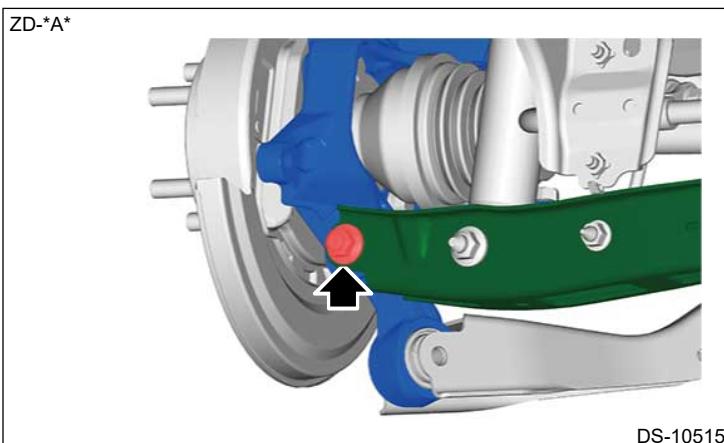
6. Remove the parking brake. [Ref. to PARKING BRAKE>Parking Brake Assembly \(Rear Disc Brake\)>REMOVAL.](#)
7. Disconnect the rear lateral link assembly front.
 - (1) Remove the snap pin (A) and nut (B).
 - (2) Separate the rear axle housing and the ball joint (C) using the ball joint puller (D).

Caution:

- Be careful not to damage the boot of the ball joint.
- Be careful not to damage the peripheral parts.

Note:

Securely hook the ball joint puller (D) to the rear axle housing.

**8.** Disconnect the trailing link assembly rear.**9.** Disconnect the rear axle housing from the rear lateral link assembly rear.**10.** Pull out the rear drive shaft from the rear hub unit bearing.

Caution:

- Be careful not to damage the spline portion of the rear drive shaft.
- Be careful not to damage the rear hub unit bearing.

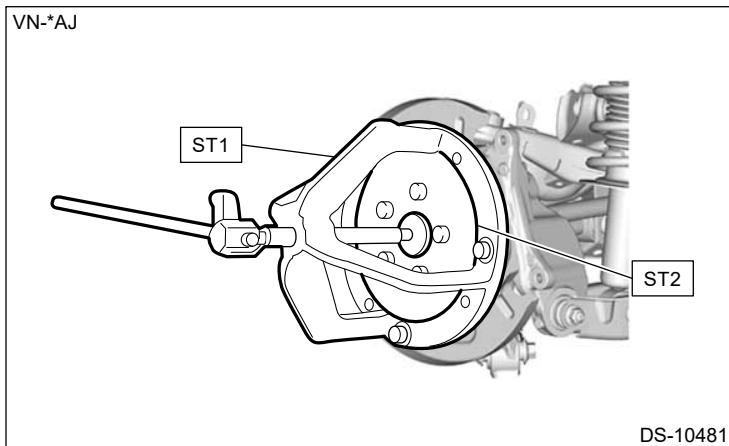
Note:

If it is hard to remove, use ST1 and ST2.

Preparation tool:

ST1: AXLE SHAFT PULLER (926470000)

ST2: AXLE SHAFT PULLER PLATE (28099PA110)

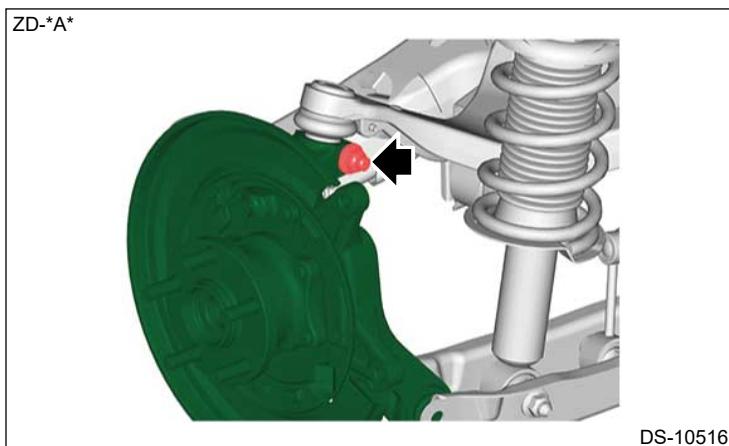


11. Hang the rear drive shaft with a string, etc.

12. Remove the rear axle housing.

Caution:

- Since the rear axle housing is heavy, be careful not to drop it.
- Be careful not to damage the boot of the ball joint.



13. Remove the rear hub unit bearing. [Ref. to PROPELLER SHAFT / DRIVE SHAFT / AXLE > Rear Hub Unit Bearing > REMOVAL.](#)

PROPELLER SHAFT / DRIVE SHAFT / AXLE > Rear Axle

INSTALLATION

1. Install the rear hub unit bearing. [Ref. to PROPELLER SHAFT / DRIVE SHAFT / AXLE > Rear Hub Unit Bearing > INSTALLATION.](#)
2. Temporarily install the rear axle housing.
(1) Temporarily install to the rear lateral link assembly front (A).

Caution:

Be careful not to damage the boot of the ball joint.

- (2) Insert the rear drive shaft (B).

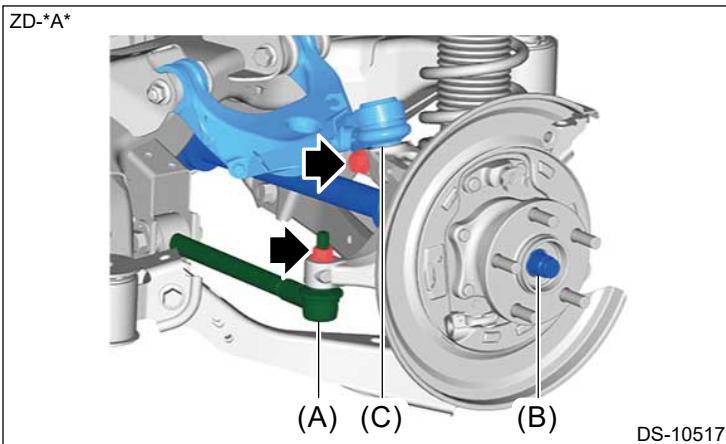
Caution:

- **Be careful not to damage the spline portion of the rear drive shaft.**
- **Be careful not to damage the rear hub unit bearing.**
- **Do not strike the rear drive shaft with a hammer, etc.**

- (3) Temporarily install to the arm assembly rear upper (C).

Caution:

- **Be sure to use new self-locking nuts and new flange bolts.**
- **Do not apply grease, etc. to the ball stud shaft portion.**
- **Be careful not to damage the boot of the ball joint.**



3. Temporarily install the rear axle housing to the rear lateral link assembly rear.

Caution:

Be sure to use a new self-locking nut.

4. Temporarily install the rear axle housing to the trailing link assembly rear.

Caution:

Be sure to use new self-locking nuts and new flange bolts.

5. Tighten the self-locking nut securing the rear axle housing to the arm assembly rear upper.

Tightening torque:

80 N·m (8.2 kgf-m, 59.0 ft-lb)

6. Connect the rear lateral link assembly front to the rear axle housing.

- (1) Connect the rear lateral link assembly front.

Caution:

Do not apply grease, etc. to the tapered portion of ball joint.

Tightening torque:

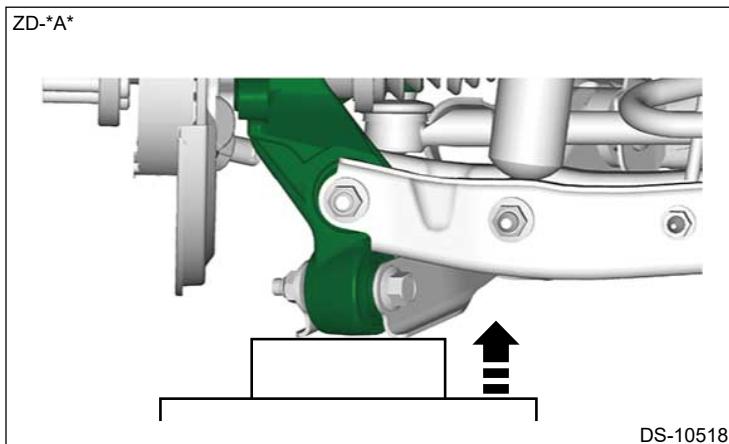
60 N·m (6.1 kgf-m, 44.3 ft-lb)

- (2) Install a new snap pin.

7. Apply a load to the rear axle housing using a transmission jack.

Note:

- **Set a wooden block, etc. on the contact surface between the transmission jack and housing.**
- **Perform this procedure in the state where the vehicle is at curb weight.**



- 8.** Tighten the bolt securing the rear axle housing to the trailing link assembly rear.

Tightening torque:

110 N·m (11.2 kgf-m, 81.1 ft-lb)

- 9.** Tighten the self-locking nut securing the rear lateral link assembly rear to the rear axle housing.

Tightening torque:

80 N·m (8.2 kgf-m, 59.0 ft-lb)

- 10.** Remove the transmission jack.

- 11.** Install the sensor sub assembly rear.

Tightening torque:

7.5 N·m (0.8 kgf-m, 5.5 ft-lb)

- 12.** Install the parking brake. [Ref. to PARKING BRAKE>Parking Brake Assembly \(Rear Disc Brake\)>INSTALLATION.](#)

- 13.** While depressing the brake pedal, install the axle nut.

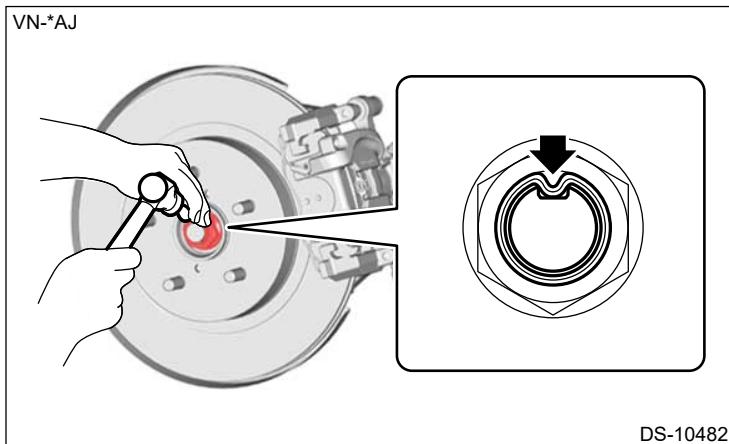
Caution:

Be sure to use a new axle nut.

Tightening torque:

190 N·m (19.4 kgf-m, 140.1 ft-lb)

- 14.** Crimp the axle nut.



- 15.** Install the rear wheels. [Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>INSTALLATION.](#)

- 16.** After the operation is completed, apply and release the parking brake five times and ensure that the brake operates normally.

- 17.** Inspect the wheel alignment and adjust if necessary. [Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION.](#)

- 18.** Perform VSC (VDC) sensor midpoint setting mode.  Ref. to VEHICLE STABILITY CONTROL>VSC (VDC) Control Module and Hydraulic Control Unit (VS/CCM&H/U)>ADJUSTMENT > VSC (VDC) SENSOR MIDPOINT SETTING MODE.

PROPELLER SHAFT / DRIVE SHAFT / AXLE > Rear Axle

DISASSEMBLY



- Pull out the rubber bushing trailing link (A) using ST1, ST2 and a press.

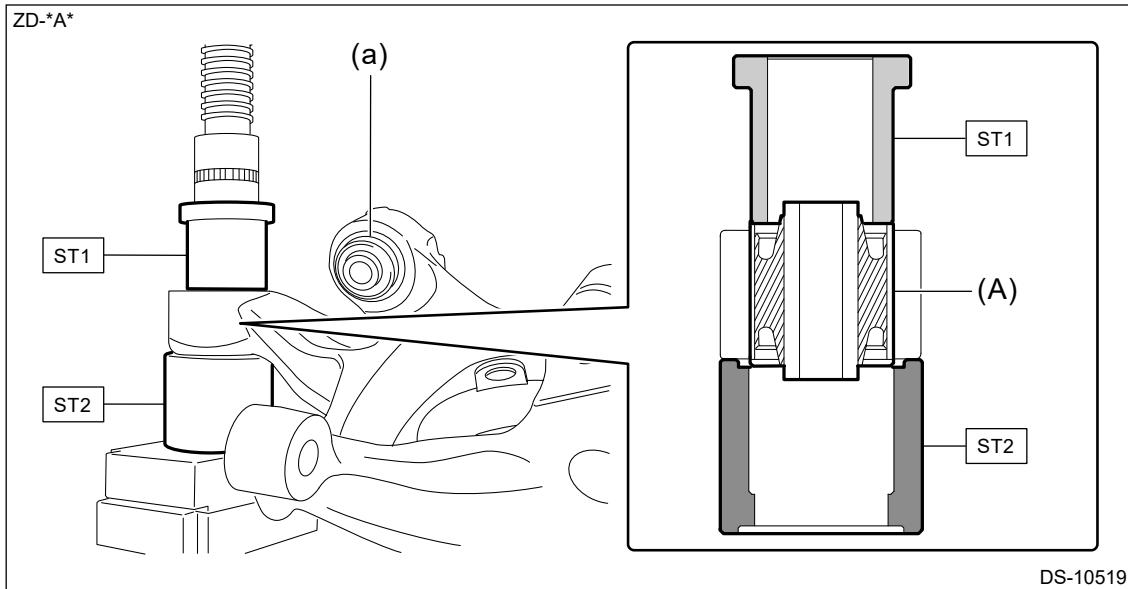
Note:

- ST1 and ST2 have different orientations for pull-out and press-fit.
- Pillow ball bushing (a) cannot be disassembled.

Preparation tool:

ST1: BUSHING REMOVER (20099FG000)

ST2: INSTALLER & REMOVER (20099PA010)



PROPELLER SHAFT / DRIVE SHAFT / AXLE > Rear Axle

ASSEMBLY

- Press-fit the rubber bushing trailing link (A) using ST1, ST2 and a press.

Caution:

Hold the bushing so that it is not tilted.

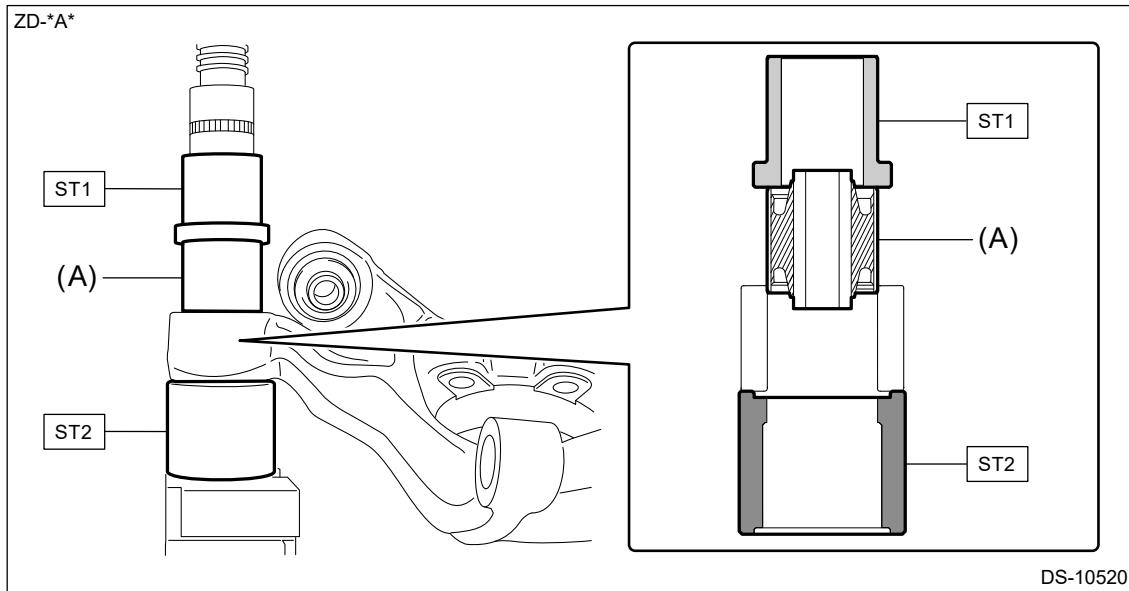
Note:

- ST1 and ST2 have different orientations for pull-out and press-fit.

Preparation tool:

ST1: BUSHING REMOVER (20099FG000)

ST2: INSTALLER & REMOVER (20099PA010)



PROPELLER SHAFT / DRIVE SHAFT / AXLE > Rear Axle

INSPECTION

1. Check that there is no deformation, cracks or other damages.
2. Check for excessive rusting.
3. Check the bushing for crack or excessive hardening.
4. Check the pillow ball bushing for looseness.

PROPELLER SHAFT / DRIVE SHAFT / AXLE > Rear Hub Unit Bearing

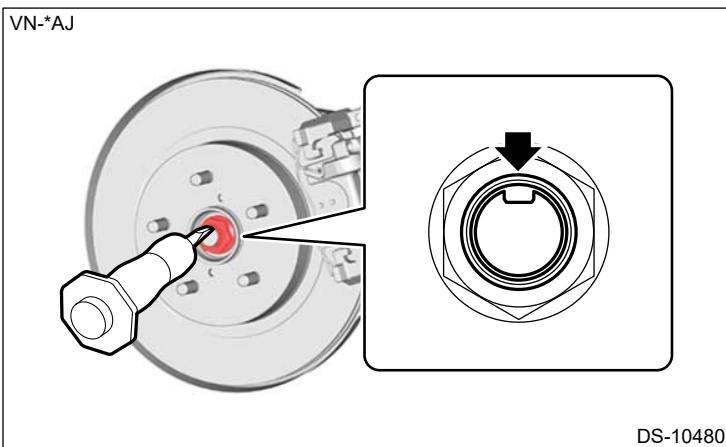
REMOVAL



Caution:

Do not loosen the axle nut while the rear axle is loaded.

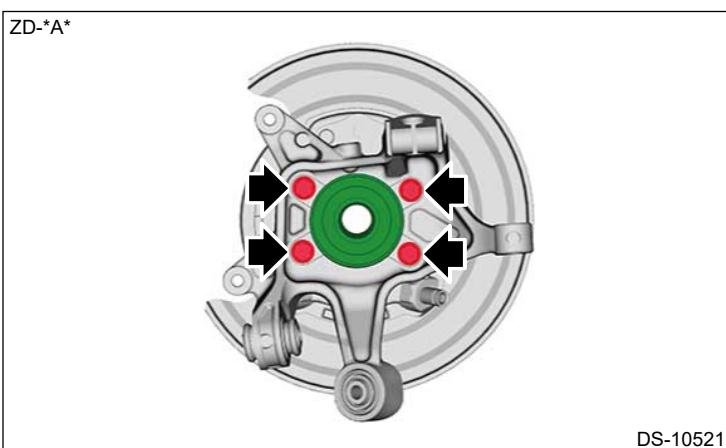
1. Release the parking brake.
2. Remove the rear wheels. [Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>REMOVAL.](#)
3. Lift the crimped section of axle nut.



4. Remove the axle nut while depressing the brake pedal.
5. Remove the parking brake. [Ref. to PARKING BRAKE>Parking Brake Assembly_\(Rear Disc Brake\)>REMOVAL.](#)
6. Remove the rear hub unit bearing and rear brake back plate.

Caution:

- Be careful not to damage the rear hub unit bearing.
- Do not get closer the tool which charged magnetism to the rear hub unit bearing.



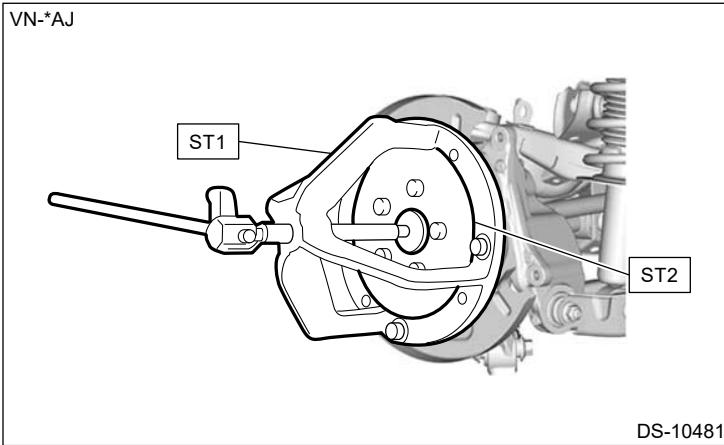
Note:

If it is hard to remove, use ST1 and ST2.

Preparation tool:

ST1: AXLE SHAFT PULLER (926470000)

ST2: AXLE SHAFT PULLER PLATE (28099PA110)



PROPELLER SHAFT / DRIVE SHAFT / AXLE > Rear Hub Unit Bearing

INSTALLATION

1. Install the rear brake back plate and rear hub unit bearing.

Caution:

- Always use a new bolt.
- Be careful not to damage the spline portion of the rear drive shaft.
- Be careful not to damage the rear hub unit bearing.
- Do not get closer the tool which charged magnetism to the rear hub unit bearing.

Tightening torque:

85 N·m (8.7 kgf-m, 62.7 ft-lb)

2. Install the parking brake. Ref. to PARKING BRAKE>Parking Brake Assembly (Rear Disc Brake)>INSTALLATION.

3. While depressing the brake pedal, install the axle nut.

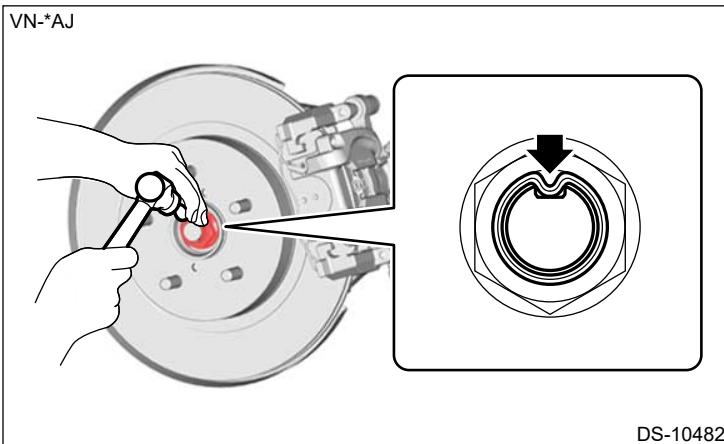
Caution:

Be sure to use a new axle nut.

Tightening torque:

190 N·m (19.4 kgf-m, 140.1 ft-lb)

4. Crimp the axle nut.



5. Install the rear wheels. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>INSTALLATION.

6. After the operation is completed, apply and release the parking brake five times and ensure that the brake operates normally.
7. Apply the parking brake.

PROPELLER SHAFT / DRIVE SHAFT / AXLE > Rear Hub Unit Bearing

DISASSEMBLY



**SUBARU
SST**

Using the ST and a press, pull out the hub bolt (B) from the rear hub unit bearing (A).

Caution:

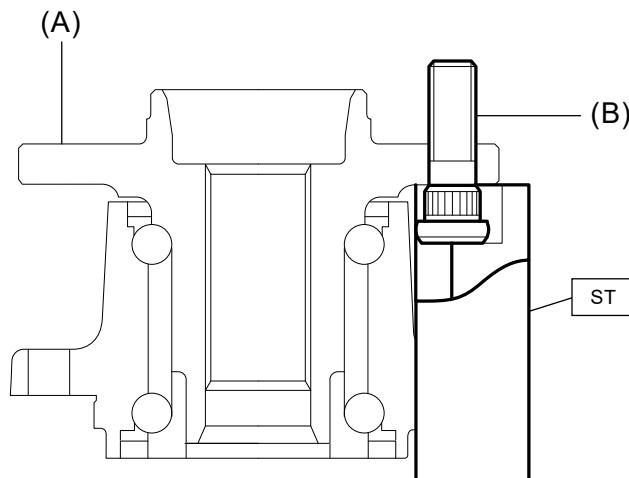
Be careful not to tap the hub bolts with a hammer, etc. This may deform the rear hub unit bearing.

Note:

Rear hub unit bearing cannot be disassembled.

Preparation tool:

ST: HUB STAND (28399AG000)



DS-10539

PROPELLER SHAFT / DRIVE SHAFT / AXLE > Rear Hub Unit Bearing

ASSEMBLY

1. Set the rear hub unit bearing and hub bolt to the ST.

Caution:

Always use a new hub bolt.

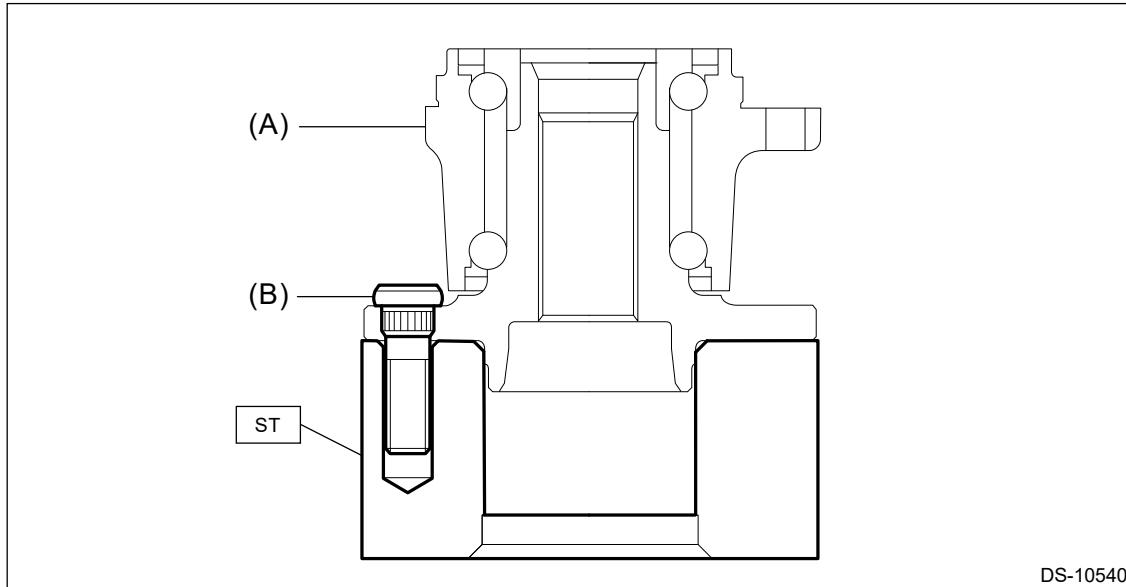
Preparation tool:

ST: HUB STAND (927080000)

2. Using a press, press-fit the hub bolt (B) until its seating surface contacts the rear hub unit bearing (A).

Note:

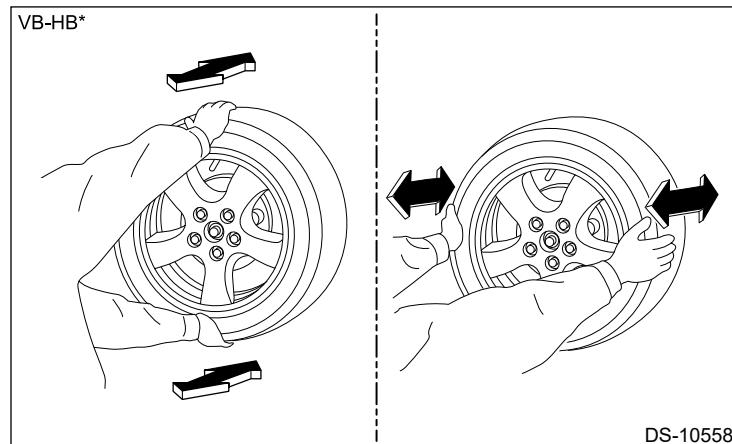
Use the 12 mm (0.5 in) dia. holes of ST to prevent bolts from tilting.



PROPELLER SHAFT / DRIVE SHAFT / AXLE > Rear Hub Unit Bearing

INSPECTION

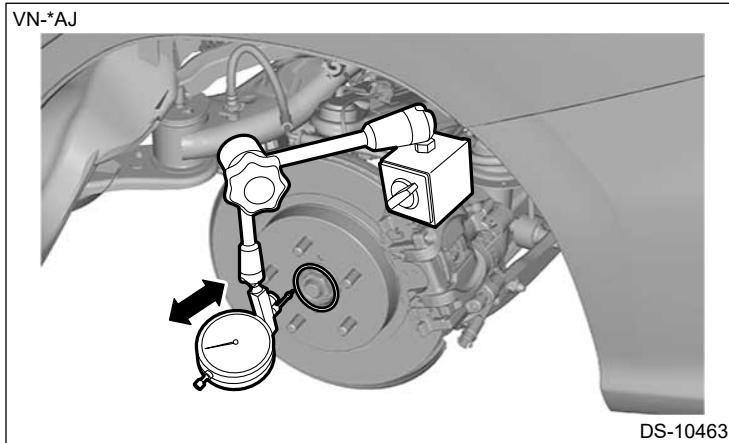
- 1.** Check that there is no deformation, cracks or other damages.
- 2.** Check for excessive rusting.
- 3.** Check the following items by turning the rear tires by hand.
 - Check for smooth rotation.
 - Check for noise.
- 4.** Check the rear hub unit bearing for looseness.
 - (1) Rock the rear tire as shown in the figure.
 - Looseness exists → Go to next step.
 - No looseness → Normal (Perform step 5 if precise inspection is required.)



- (2) Check the play with the brake pedal depressed using the same procedure as step (1).
 - Looseness exists → Check the ball joint, each bushing, rear suspension and rear axle housing.
 - No looseness → Replace the rear hub unit bearing.
- 5.** To perform a precise inspection, use a magnet stand and dial gauge to check for looseness in the axial direction of the rear hub unit bearing.

Service limit:

0.05 mm (0.002 in)



PROPELLER SHAFT / DRIVE SHAFT / AXLE > Symptoms and causes**INSPECTION****Caution:**

If noise occurs, identify the cause before work.

Symptoms	Problem parts etc.	Possible cause
Booming noise or vibration occurs at a specific vehicle speed.	Propeller shaft	Unbalanced propeller shaft
		Deformation, damage or excessive hardening of bushing
		Looseness at joint section
Continuous noise during driving (frequency is proportional to vehicle speed)	Companion flange of rear differential	Deformation, unbalance or loose connection of companion flange
	Hub unit bearing	Defective hub unit bearing
Noise when turning	Propeller shaft	Defective center bearing
	Drive shaft	Defective joint section